

ROOSEVELT WILD LIFE
ANNALS





Digitized by the Internet Archive
in 2015

BULLETIN

OF

THE NEW YORK STATE COLLEGE OF FORESTRY

AT SYRACUSE UNIVERSITY

HUGH P. BAKER, *Dean*

Roosevelt Wild Life Annals

VOLUME 2

NUMBERS 3 AND 4

OF THE

Roosevelt Wild Life Forest Experiment Station



Entered as second-class matter October 18, 1927, at the Post
Office at Syracuse, N. Y., under the
Act of August 24, 1912

ANNOUNCEMENT

The serial publications of the Roosevelt Wild Life Forest Experiment Station consist of the following:

1. **Roosevelt Wild Life Bulletin.**
2. **Roosevelt Wild Life Annals.**

The *Bulletin* is intended to include papers of general and popular interest on the various phases of forest wild life, and the *Annals* those of a more technical nature or having a less widespread interest.

The editions of these publications are limited and do not permit of general free distribution. Exchanges are invited. The subscription price of the *Bulletin* is \$4.00 per volume of four numbers, or \$1.00 per single number. The price of the *Annals* is \$5.00 per volume of four numbers, or \$1.25 per single number. All communications concerning publications should be addressed to

THE DIRECTOR AND EDITOR,
Roosevelt Wild Life Forest Experiment Station,
Syracuse, New York.

TRUSTEES OF THE NEW YORK STATE COLLEGE OF FORESTRY

Ex OFFICIO

Dr. CHARLES W. FLINT, <i>Chancellor</i>	Syracuse University
Dr. FRANK P. GRAVES, <i>Commissioner of Education</i>	Albany, N. Y.
Hon. HENRY MORGENTHAU, JR., <i>Conservation Commissioner</i>	Albany, N. Y.
Hon. HERBERT H. LEHMAN, <i>Lieutenant-Governor</i>	Albany, N. Y.

APPOINTED BY THE GOVERNOR

Hon. JOHN R. CLANCY.....	Syracuse, N. Y.
Hon. HAROLD D. CORNWALL.....	Glenfield, N. Y.
Hon. GEORGE W. DRISCOLL.....	Syracuse, N. Y.
Hon. WILLIAM H. KELLEY.....	Syracuse, N. Y.
Hon. ALFRED E. SMITH.....	New York City
Hon. EDWARD H. O'HARA.....	Syracuse, N. Y.
Hon. CHARLES A. UPSON.....	Lockport, N. Y.
Hon. J. HENRY WALTERS.....	New York City
Hon. EDMUND H. LEWIS.....	Syracuse, N. Y.

OFFICERS OF THE BOARD

Hon. ALFRED E. SMITH.....	<i>President</i>
Hon. JOHN R. CLANCY.....	<i>Vice-President</i>

HONORARY ADVISORY COUNCIL OF THE ROOSEVELT WILD LIFE STATION

AMERICAN MEMBERS

Mrs. CORINNE ROOSEVELT ROBINSON.....	New York City
Hon. THEODORE ROOSEVELT.....	New York City
Mr. KERMIT ROOSEVELT.....	New York City
Dr. GEORGE BIRD GRINNELL.....	New York City
Hon. GIFFORD PINCHOT.....	Milford, Pa.
Mr. CHAUNCEY J. HAMLIN.....	Buffalo, N. Y.
Dr. GEORGE SHIRAS, 3rd.....	Washington, D. C.
Dr. FRANK M. CHAPMAN.....	New York City
Dean HENRY S. GRAVES.....	New Haven, Conn.

EUROPEAN MEMBER

VISCOUNT GREY.....	Fallodon, England
--------------------	-------------------

ROOSEVELT WILD LIFE STATION STAFF

HUGH P. BAKER, M.F., D.Oec.....Dean of the College

CHARLES E. JOHNSON, A.M., Ph.D.....Director of the Station
WILFORD A. DENCE, B.S.....Ichthyologist and Ass't Director
MIRIAM S. MOCKFORD.....Secretary

Temporary Appointments*

MYRON T. TOWNSEND, Ph.D.....Field Naturalist
M. W. SMITH, M.A.....Field Naturalist
JUSTUS F. MULLER, Ph.D.....Field Naturalist
DAYTON STONER, Ph.D.....Field Ornithologist
CHARLES J. SPIKER, A.B., M.A.....Field Naturalist
LEROY STEGEMAN, M.S.....Field Naturalist
H. J. VAN CLEAVE, Ph.D.....Field Naturalist

*Including only those who have made field investigations and whose reports are now in preparation.

GENERAL CONTENTS

	PAGE
Ornithology of the Oneida Lake Region: with Reference to the Late Spring and Summer Seasons	Dayton Stoner 277

ILLUSTRATIONS

PLATES

Plate 1. Composite group of shore and other birds on sand beach at east end of Oneida Lake	Facing 277
Plate 2. Composite group of shore and other birds on Wantry Island.....	Facing 494

FIGURES

(All photographs by the author unless otherwise indicated.)

Fig. 117. Field quarters at Lower South Bay.....	281
Fig. 118. Van Antwerp woods. Example of isolated wooded tract characteristic of the south side of Oneida Lake. June 12, 1929.....	281
Fig. 119. Looking north on road through Cicero Swamp near Hall Island. May 26, 1928	299
Fig. 120. Cicero Swamp near Hall Island. Habitat of white-throated sparrow and Canada and magnolia warblers. May 26, 1928.....	299
Fig. 121. Buckwheat field near village of Cicero. The seeds are a favorite food of English sparrows, eastern goldfinches and other granivorous birds. August 15, 1928	300
Fig. 122. Low open meadow and plowed field near Hall Island. Habitat of prairie horned lark, pipit and eastern Savannah sparrow. May 9, 1929.....	300
Fig. 123. Maple woods and hummocky swamp. Maple Bay district. Habitat of marsh hawk. May 4, 1928.....	307
Fig. 124. Maple Bay hardwoods. Habitat of eastern winter wren, Louisiana water-thrush and swamp sparrow. May 4, 1928.....	307
Fig. 125. Short Creek where it enters Maple Bay. Habitat of common black duck and eastern green heron. June 28, 1928. (Photo by W. A. Dence.).....	308
Fig. 126. Mud Creek near village of Cicero. Habitat of American bittern and eastern red-winged blackbird. July 25, 1927. (Photo. by W. A. Dence.).....	308
Fig. 127. Wright woods, Lower South Bay district. Hemlock-elm-beech with undergrowth of blackberry, raspberry and elderberry. July 17, 1928.....	313
Fig. 128. Maple woods on low flat at mouth of Chittenango Creek. May 28, 1928.....	313
Fig. 129. Alder thicket, west side of mouth of Chittenango Creek. Habitat of Canada warbler and northern Maryland yellow-throat. June 11, 1928.....	314
Fig. 130. Willow flats along south side of Chittenango Creek near its mouth. May 11, 1929	314
Fig. 131. Gravel beach at Delmarter Bay. Feeding ground for spotted sandpiper and semipalmated plover. July 13, 1928.....	323
Fig. 132. Reverted grassy field, Delmarter Bay district. Habitat of bobolink and eastern Savannah sparrow. July 12, 1929.....	323
Fig. 133. Looking north along Verona Beach. August 13, 1929.....	324
Fig. 134. Looking north along Oakland Beach. September 9, 1927. (Photo. by T. L. Hankinson)	324
Fig. 135. Verona Beach. A congregating place for shore birds. August 13, 1928.....	327
Fig. 136. Verona Beach. Beach pool and aquatic vegetation in foreground. A typical shore bird habitat. August 13, 1928.....	327
Fig. 137. Verona Beach, looking north, east shore of Oneida Lake. Mixed woods along higher part of shore. August 13, 1928.....	328
Fig. 138. Shallow pools at Verona Beach. Feeding grounds of least and semipalmated plovers and other shore birds. August 13, 1928.....	328
Fig. 139. Tall white pines at Verona Beach. Lookouts for eastern crows. August 13, 1928	337
Fig. 140. Fern hummocks in shallow pool. McClanathan maple woods, three-fourths mile northeast of Sylvan Beach. July 11, 1929	337
Fig. 141. Barge Canal and breakwater at Sylvan Beach. A favorite gathering place for gulls, terns and shore birds. August 13, 1928.....	338
Fig. 142. Stone breakwater at entrance to Barge Canal, Sylvan Beach. August 13, 1928	338

Roosevelt Wild Life Annals

PAGE

Fig. 143. Grassy willow swamp near South Bay. Home of Wilson's snipe, American bittern and swamp sparrow. May 13, 1929.....	365
Fig. 144. Looking southeast over Oneida Lake from a point about one mile north of village of North Bay. September 9, 1929. (Photograph by T. L. Hankinson).....	365
Fig. 145. Sand beach along Fish Creek near village of Fish Creek Landing. Habitat of killdeer and spotted sandpiper. July 12, 1928.....	366
Fig. 146. Hemlock, maple and birch woods one-half mile north of village of Cleveland. June 13, 1928.....	366
Fig. 147. In the field; cut-over tract one mile north of Jewell. June 8, 1929.....	373
Fig. 148. Hemlock-maple woods about two miles north of Cleveland. Home of black-throated blue, black-throated green and magnolia warblers and the oven-bird. June 13, 1928.....	373
Fig. 149. Brush piles in clearing at edge of Vandercamp woods two miles northwest of Cleveland. Habitat of indigo bunting, red-eyed vireo, towhee and eastern field sparrow; also black-billed cuckoo in maple and aspen seedlings in background. June 25, 1928.....	374
Fig. 150. Blueberry thicket and second growth trees one mile west of village of North Bay. Towhee habitat. May 16, 1928.....	374
Fig. 151. Emmons woods from west side. West side of Big Bay. Maples and hemlocks. Habitat of cerulean, magnolia, black-poll, redstart and other warblers and of scarlet tanager and olive-backed thrush. May 21, 1928.....	381
Fig. 152. Scene in maple-hemlock portion of Emmons woods. May 21, 1928.....	381
Fig. 153. Pond three miles north of Cleveland. Habitat of eastern red-winged blackbird, black-billed cuckoo, redstart and oven-bird. June 10, 1929.....	382
Fig. 154. Panther Lake looking west along north shore. July 30, 1928.....	382
Fig. 155. Francis Pond about four miles northwest of Cleveland. A favorite resort of eastern bluebirds, tree swallows, eastern belted kingfishers and great blue herons. July 28, 1928.....	389
Fig. 156. Looking east across Kibby Lake. June 15, 1928.....	389
Fig. 157. West end of Kibby Lake. Hemlocks and maples in background. Pond lilies and some duckweed on water. June 15, 1928.....	390
Fig. 158. Maples, birches and a few beeches. Sauers woods south of West Monroe Cemetery. May 8, 1928.....	390
Fig. 159. Bushy tangles and second growth pines on old cleared area bordering wooded tract about two miles north of Cleveland. Habitat of eastern field sparrow and indigo bunting. June 13, 1928.....	397
Fig. 160. Grassy field bordering mixed woods. Big Bay district. June 8, 1928.....	397
Fig. 161. Road through swamp, Big Bay district. June 8, 1928.....	398
Fig. 162. West side of Big Bay looking north. July 13, 1928. (Photo. by W. A. Dence.).....	398
Fig. 163. Three Mile Creek, one-half mile from shore line, east side of Big Bay. Arrow arum and swamp loosestrife afford abundant cover for many species of birds. August 10, 1928.....	405
Fig. 164. Big Bay swamp. Habitat of eastern red-winged blackbirds, bronzed grackles, tree swallows, eastern green herons and great blue herons. July 26, 1929.....	405
Fig. 165. Cicero Swamp one and one-half miles southwest of Clay. Eastern green heron perched in dead tree. August 7, 1928.....	406
Fig. 166. Arrow arum, marsh grass and ferns in Cicero Swamp one and one-half miles southwest of Clay. Habitat of Virginia rail and Florida gallinule. June 18, 1929.....	406
Fig. 167. Cat-tail marsh, pond and old muskrat house in Cicero Swamp one and one-half miles southwest of Clay. August 9, 1928.....	413
Fig. 168. Mud Creek in Cicero Swamp one and one-half miles southwest of Clay. July 6, 1928.....	413
Fig. 169. Mud Creek in Cicero Swamp one and one-half miles southwest of Clay. Habitat of Florida gallinule, eastern least bittern, long-billed marsh wren and swamp sparrow. July 6, 1928.....	414
Fig. 170. Wantray Island. July 24, 1928.....	414
Fig. 171. Blind erected for observation of shore birds on Wantray Island. July 24, 1928.....	427
Fig. 172. Bowldery shore on west side of Wantray Island. July 24, 1928.....	427
Fig. 173. Spotted and pectoral sandpipers at north end of Wantray Island. July 19, 1928.....	428
Fig. 174. East side of Wantray Island. Woods on north side of Oneida Lake in background. July 24, 1928.....	428
Fig. 175. Dunham Island from shore at Lower South Bay. July 12, 1929.....	437
Fig. 176. South end of Frenchman Island. Water lilies, cat-tails and sedges. Feeding place of great blue heron and common black duck. July 24, 1928.....	437
Fig. 177. Small cat-tail bordered bayou at trolley station, Lower South Bay. Feeding place of horned and pied-billed grebes. July 17, 1928.....	438

Ornithology of the Oneida Lake Region

PAGE

Fig. 178. View along north shore of Long Island, September 9, 1915. (Photograph by F. C. Baker.)	438
Fig. 179. Nest of eastern green heron; contains five young. Emmons Woods. June 17, 1929	443
Fig. 180. Nest and four eggs of eastern least bittern. Cat-tail marsh in Coble Bay district. June 23, 1930. (Photograph by W. A. Dencc.)	443
Fig. 181. Dead shag-bark hickory tree in open field one mile west of Bridgeport. Lookout perch for eastern sparrow hawk. July 24, 1929.....	444
Fig. 182. Grassy marsh at Shaw Point. Habitat of marsh hawk, eastern red-winged blackbird and Wilson's snipe. May 22, 1929.....	444
Fig. 183. Nesting site of eastern sparrow hawk; dead stub of maple tree. Oakland Beach, fifty yards from shore of Oneida Lake. June 30, 1928.....	449
Fig. 184. Young eastern sparrow hawks. Nest in maple tree at Oakland Beach. June 30, 1928	449
Fig. 185. Nest and eggs of ring-necked pheasant in hay field. Muskrat Bay district. July 18, 1928.....	450
Fig. 186. Young pectoral sandpiper at Sylvan Beach. May 16, 1928.....	450
Fig. 187. Greater yellow-legs at Sylvan Beach. May 16, 1928.....	475
Fig. 188. Pectoral sandpiper at Sylvan Beach. July 12, 1928.....	475
Fig. 189. Herring gull. Verona Beach. June 11, 1929.....	476
Fig. 190. Ring-billed and herring gulls on stone breakwater at Sylvan Beach. August 9, 1929	476
Fig. 191. Ring-billed and herring gulls in flight about breakwater at entrance to Barge Canal. Sylvan Beach. August 9, 1929.....	484
Fig. 192. Nest and eggs of common tern on Long Island. August 2, 1929.....	484
Fig. 193. Nest and eggs of common tern on Long Island. August 2, 1929.....	511
Fig. 194. Burrow of eastern belted kingfisher in sand pit one mile north of Jewell. June 8, 1929.....	511
Fig. 195. A family of young belted kingfishers. Upper row photographed on June 16, 1928, when about three weeks old. The birds have been banded. The middle rows show different poses of the same family on June 23. The lower row shows the family as photographed on June 27	512
Fig. 196. Workings of northern pileated woodpecker in Adirondack forest. (Photograph by C. E. Johnson).....	521
Fig. 197. Diagram illustrating type of work of northern pileated woodpecker observed on hemlock tree in Constantia Center district. July 31, 1928.....	521
Fig. 198. Eastern robin at martin house, Lower South Bay district. The robin successfully reared a brood in this house. May 23, 1928.....	522
Fig. 199. Removing nests of English sparrow from martin house. Note the method of hanging the supporting pole on a bolt. Another long bolt through the pole holds it in an upright position. May 27, 1928	522
Fig. 200. House erected for purple martins. Lower South Bay. May 27, 1928.....	522
Fig. 201. Bird houses on lawn of summer home at Lower South Bay. May 2, 1928.....	529
Fig. 202. Purple martins on telephone wires, Lower South Bay. August 15, 1928.....	529
Fig. 203. Chittenango Creek near its mouth. Nesting habitat of eastern kingbird, northern crested flycatcher, bronzed grackle and tree swallow. The stump on the bank at the right of the scene hides an incubating tree swallow. May 28, 1928	530
Fig. 204. Adult tree swallow and stump containing nest and eggs from which the incubating bird was taken. Chittenango Creek. May 28, 1928.....	547
Fig. 205. Adult banded tree swallow. May 28, 1928.....	547
Fig. 206. Barn swallows on telegraph wires, Cicero Swamp southwest of Clay. August 9, 1928	547
Fig. 207. Bank swallow burrows in bank of Fish Creek at village of Fish Creek Landing. July 12, 1928	553
Fig. 208. Near view of bank swallow burrows in sandy bank of Fish Creek opposite village of Fish Creek Landing. July 12, 1928.....	553
Fig. 209. Burrows of bank swallows in sand pit. Oak Orchard district. July 9, 1928.....	554
Fig. 210. Burrows of bank swallows at Delahunt sand pit near Cleveland showing proximity of burrows to a more or less constantly used sand pump. June 23, 1928	554
Fig. 211. Nest of bank swallow exposed by falling away of sand bank. Fish Creek near village of Fish Creek Landing. Note white lining composed of feathers from domestic fowl. July 12, 1928	557
Fig. 212. Burrows of bank swallows in sandy bank of Fish Creek. Note claw marks at opening of completed burrow and in the incomplete one. July 12, 1928	557

Roosevelt Wild Life Annals

	PAGE
Fig. 213. Gordon Pond showing decaying stumps in which eastern bluebirds and tree swallows nest. May 31, 1929.....	569
Fig. 214. Gordon Pond and hemlock woods surrounding it. May 31, 1929.....	569
Fig. 215. Captive immature eastern crow. June 15, 1928.....	570
Fig. 216. Blind erected in corn field from which eastern crows were shot as they pulled up the newly sprouted corn. Muskrat Bay district. June 1, 1928.....	570
Fig. 217. Large rags suspended in wires stretched above and around this corn field have been employed as a frightening device to keep away eastern crows. North Bay district. June 16, 1928.....	576
Fig. 218. Scarecrow at edge of cornfield, Maple Bay district. June 2, 1928.....	576
Fig. 219. Scarecrow in cornfield near Hitchcock Point. June 22, 1929.....	576
Fig. 220. Nest of short-billed marsh wren; long marsh grass at abandoned farmhouse two miles south of Lakeport. July 24, 1929.....	587
Fig. 221. Nest of long-billed marsh wren in narrow-leaved cat-tails and arrow arum. Cicero Swamp, one and one-half miles southwest of Clay. June 18, 1929.....	587
Fig. 222. White oak, black oak, pitch pine and hemlock woods one mile east of Verona Beach. August 13, 1928.....	603
Fig. 223. Nest and young of veery. Young about ready to leave nest. Blueberry and fern undergrowth in woods illustrated in Fig. 222. July 22, 1929.....	603
Fig. 224. Nest of eastern yellow warbler with two floors constructed by the bird in an attempt to avoid incubating a cowbird egg laid in floor of original nest. Nest in rose bush at residence in Lower South Bay district. Side cut away to show interior. June 4, 1928. <i>a</i> , floor of new nest; <i>b</i> , floor of original nest on which were deposited a cowbird's egg and two yellow warbler eggs; <i>c</i> , opening of new nest; <i>d</i> , side of original nest, cut away to expose interior.....	633
Fig. 225. Nest of redstart in ironwood sapling. Ladd woods, Muskrat Bay district. July 18, 1928.....	633
Fig. 226. Willow swamp, Big Bay district. Breeding place of eastern red-winged blackbird. June 8, 1928.....	685
Fig. 227. Willow swamp in South Bay district. Habitat of eastern red-winged blackbird, American bittern and Wilson's snipe, May 16, 1928.....	685
Fig. 228. Nest of eastern red-winged blackbird in willow swamp one mile south of Sylvan Beach. May 16, 1928.....	686
Fig. 229. Nest of eastern red-winged blackbird in grassy marsh about two miles west of village of West Monroe. Nest contains two eggs and two very small young. May 29, 1928.....	686
Fig. 230. Young eastern red-winged blackbirds from nest in grassy marsh one mile west of village of West Monroe. July 8, 1928.....	686
Fig. 231. Nest and four eggs of eastern hermit thrush. Widrig woods. June 20, 1929.....	690
Fig. 232. Nest and five eggs of song sparrow in maple sapling, West Monroe district. May 15, 1929.....	690
Fig. 233. Nest and three eggs of eastern vesper sparrow among dewberry vines at edge of woods. Oak Orchard. July 9, 1928.....	731
Fig. 234. Nest and eggs of eastern chipping sparrow. Nest on ground under iron fence surrounding West Monroe Cemetery. May 22, 1928.....	731

MAPS

Map 2. Map of Oneida Lake and contiguous territory showing routes traversed and places visited during this investigation. Adapted from the U. S. Geological Survey Quadrangles. Key shows counties immediately surrounding Oneida Lake and the location of this lake in relation to other central New York lakes. *At end*



PLATE 1. COMPOSITE GROUP OF SHORE AND OTHER BIRDS ON SAND BEACH AT EAST END OF ONEIDA LAKE

- 1: Ruddy Turnstone.
- 2: Semipalmated Plover.
- 3: Least Sandpiper.
- 4: Semipalmated Sandpiper.
- 5: Spotted Sandpiper.
- 6: Herring Gull.

- 7: Black-crowned Night Heron.
- 8: Crows.
- 9: Pectoral Sandpiper.
- 10: Killdeer.
- 11: Black-bellied Plover.
- 12: Lesser Yellow-legs.

ORNITHOLOGY OF THE ONEIDA LAKE REGION: WITH REFERENCE TO THE LATE SPRING AND SUMMER SEASONS

BY DAYTON STONER

*Field Ornithologist, Roosevelt Wild Life
Forest Experiment Station, Syracuse, N. Y.*

CONTENTS

	PAGE
1. Introduction and Acknowledgments	278
2. General Discussion of Oneida Lake and Contiguous Territory.....	284
Geographical Location, Topographical and Vegetational Features	284
Geological Features	285
Climatological Features	286
Life Zones and Faunal Areas.....	292
3. Descriptions of Selected Bird Habitats in the Region.....	294
4. Some Special Local Ecological Considerations as Reflected in the Avifauna of the Region.....	331
5. Tabular List of the Late Spring and Summer Birds Observed in the Region	342
6. Annotated List of the Late Spring and Summer Birds Observed in the Region	361
7. Annotated List of Birds Banded in the Region.....	737
8. Annotated Supplementary List of the Late Spring and Summer Birds Recorded for the Region	740
9. List of References	753
10. Index	760

INTRODUCTION AND ACKNOWLEDGMENTS

This report, dealing with the late spring and summer birds of the Oneida Lake region, has been prepared in an attempt to set forth the present-day status of the birds known to frequent this territory at that season as well as to indicate something of their mode of occurrence, habits and ecologic relations with special reference to conditions in the area under consideration. Among other things, also, some attention has been given to the general economic status of the species discussed in these pages. It is hoped that the results of this investigation will be useful, not only in a local way, but also that they will be of interest in a larger sense and that they may contribute in some measure to a better knowledge of the ornithology of the State of New York.

While the title of this report does not suggest any definite period over which observations were conducted, it may be stated here that the field work upon which it is based extended between May 1 and August 15 during the season of 1928 when practically the entire time was spent afield, and the same period during the 1929 season when only half-days were given over to exploration and field observation. Not often did the scope of the territory investigated lie more than

four miles from Oneida Lake and, for the most part, field activities were limited to a distance of one to two miles from that body of water.

In Eaton's classic memoir on the birds of New York State (1910 and 1914), 411 species are listed from the Commonwealth. Since the appearance of that report a number of species have been added to those recorded by him and by others so that the total number of birds now known to occur or to have occurred in the State probably numbers more than 425 forms.

A great many local lists dealing with the bird fauna of more or less restricted districts in the State also have been published from time to time. Some of these lists are extensive and complete, the data having been compiled from records and observations carried on over a period of years. Others are brief and the information contained in them is rather meager. In addition, supplemental information in the way of brief notes and occasional exhaustive studies and reports on the birds of New York State have been made available.

Except a few scattered notes which have appeared from time to time in various ornithological journals and other publications, no definite action has previously been taken to ascertain the kinds of birds, their relative local abundance and distribution, breeding habits, ecological and economic relations and the like in the territory immediately surrounding Oneida Lake. While the present report is limited in its scope, due in part to the necessity of restricting the amount of time available for the survey to two seasons as well as of confining it to the late spring and summer months, it is hoped that the effort will serve a purpose in aiding to fill one of the gaps in the ornithological literature of the State.

In this report, 170 forms are listed as having been observed in the region during the course of these studies; two additional forms were determined provisionally in the field while the fresh workings of another bird were discovered although the bird itself was not seen. To this list of 173 forms, a supplementary list of sixty-seven forms has been added. These have been recorded by others from this approximate region, but greater flexibility in the time limits is conceded than those which circumscribed my own observations. With these additions, notations on 240 forms of birds are included in the following pages.

Of the published papers dealing in any comprehensive way with the bird fauna of the territory about Oneida Lake, "The Annotated List of the Birds of Oneida County, New York, and of Its Immediate Vicinity" by Ralph and Bagg (1886, pp. 101-147) was the first and most elaborate. This was followed by Barnum's "A List of the Birds of Onondaga County" (1886, pp. 1-34) and by intermittent and subsequent brief supplementary additions to the fauna of Oneida and adjoining counties by Ralph and Bagg. Embury's "Birds of Madison County, New York" (1901, pp. 1-36), was the next contribution to the ornithological literature of this area. This was followed in 1910 by another list of Oneida County birds by Bagg (1910, pp. 16-85). Eaton's work (1910 and 1914) includes the essentials of all these findings together with many additional data on the ornithology of the State as a whole.

The most recent local report on the birds of any district adjacent to Oneida Lake is a twenty-page booklet by Sadler (1926) entitled "Birds of Syracuse and

Vicinity" which includes brief annotations on 200 species. Several references are made relative to the occurrence of certain species on and about Oneida Lake.

With the exception of Eaton's beautifully executed report, all the others consist of brief annotations dealing mostly with locality records and local abundance of the species recorded. It is also in an attempt to fill this deficiency in some measure that the present report is offered.

While, of course, it is unlikely that one would secure a *complete* list of the birds of the region in the limited time available for the work, the 170 species observed by us, together with the records of others who have made observations here, will serve to give a fairly satisfactory notion of the bird life in this interesting country during the late spring and summer migration period as well as during the breeding season.

Since, for a long time, little intensive ornithological work has been attempted in the Oneida Lake region, one of the first major objectives in our plan of attack was to build up a list of the birds as we found them in the territory during the time covered in our studies. The rate of growth of this list for the two seasons in which our field observations were carried on is indicated in tabular form on pages 343 to 360 of this report.

Upon our arrival in the region, Mrs. Stoner and I established field quarters at a comfortable country home near Lower South Bay about fifteen miles northeast of Syracuse and 100 yards from the shores of Oneida Lake (Fig. 117). With this as our base, field work on the present project was begun on May 1, 1928, and continued without interruption until August 15. When the weather permitted, almost daily trips were made into the surrounding territory. The area on the south side of Oneida Lake was studied more intensively during the period of our stay at this place.

Sometimes we worked on foot through the fields and woods and along the lake shore in the immediate vicinity of our quarters, again, by means of a motor car the more distant points about the south side of the lake and, to some extent, also certain of those on the north side were made accessible.

It was our custom to drive out in early morning to some known or suspected point of local ornithological interest, perhaps stopping several times en route to listen for bird calls or songs or to make a brief exploration of some bit of pasture, swamp or woodland near the highway. Not only the fine paved State highways were used but the earth and gravel side roads as well. In this manner different types of habitat were made easily accessible. In addition, a better knowledge of drainage, topography and other local conditions was acquired more quickly than otherwise would have been possible. Topographic maps of the region prepared by the United States Geological Survey were employed freely, and a daily record in color was kept on them to show the route traveled and the locality visited.

Arrived at the area selected for the morning's work, hip boots or puttees were usually donned and I proceeded on foot through the territory, sometimes walking in a broad circle from the highway to return to it a half mile or more beyond the place where I entered the woodland or swamp. There I would be met by my wife in the automobile and we proceeded on to another tract. Not infrequently we followed an old wood road through the forest, making short detours

from it as occasion warranted. In a half day or a day spent in this manner a considerable variety of topographic, ecological, vegetational and ornithological conditions would be encountered. Certain favorable and productive localities were visited at frequent intervals while other areas were visited only once. Of course it goes without saying that in a territory as large as this a number of ornithologically productive habitats undoubtedly were missed. However, effort was made to explore as many and as great a variety as possible.

In addition, the islands of the lake as well as portions of its shore line and some of the creeks that flow into it were investigated at intervals, transportation being effected by rowboat, motorboat, automobile or by walking as occasion or requirements demanded.

During May, much of the low land of the region—and it is of vast extent—is covered either wholly or in part by water from the rapidly melting late spring snows and the usually copious late spring and early summer rains. This means that wading boots are a constant part of the field equipment; it often happened that the observer was compelled to wear them during the greater part of the day.

Later in the season, temporary field quarters were established in the village of Cleveland on the north side of Oneida Lake, and from this base the wooded territory of that and adjoining districts could be reached more advantageously. After a fortnight here our base was again transferred to Lower South Bay where we remained until July 26, when Cleveland again became our base for several days, whereupon the season's work was completed with Lower South Bay again as our center of operations.

By thus alternating between the north and south districts we were able to secure data on the relative abundance and occurrence as well as upon the habits and other matters relating to the birds of the entire region. As a result of this procedure a large part of the territory in the immediate vicinity of the lake shore, as well as the shore itself and all the islands but Leete Island, were covered fairly well.

During the season of 1929, field operations were again instituted on May 1, with the same country home occupied in 1928 at Lower South Bay serving as our headquarters. However, in the summer of 1929 our field work was confined to half-day periods, the morning hours, while the afternoons were given over to the preparation of manuscript. On May 15 quarters were again taken up in Cleveland, thus giving a period in that district for which we had no continuous observations during the preceding season. The following brief table will indicate the length of time spent in each district during the two seasons' work and will illustrate the continuity of field work in the two districts when the two seasons are taken into consideration.

TABLE NO. 10. SHOWING RELATIVE LENGTH OF TIME SPENT AT THE FIELD STATIONS IN THE ONEIDA LAKE REGION.

LOWER SOUTH BAY DISTRICT		CLEVELAND DISTRICT	
1928 SEASON	1929 SEASON	1928 SEASON	1929 SEASON
May 1 to June 11	May 1 to May 15	June 12 June 30	May 16 to June 11
July 1 to July 25	June 12 to July 16	July 26 to Aug. 6	July 17 to Aug. 5
Aug. 7 to Aug. 15	Aug. 6 to Aug. 15		



Fig. 117. Field quarters at Lower South Bay.



Fig. 118. Van Antwerp woods. Example of isolated wooded tract characteristic of the south side of Oneida Lake. June 12, 1929.

The summer of 1930, from May 12 to August 26, inclusive, was given over to the completion of the manuscript which forms the bulk of this report.

In the preparation of this report an attempt has been made not to repeat a great number of already well known facts simply as such, but to make the discussion as locally applicable and informational as possible by including only as much general information as seems advisable for the species under consideration. Therefore the attention given to the various species is not intended to include a comprehensive account of the birds concerned; that has already been done many times. Instead, I have tried to present the data that I have obtained with relation to the occurrence of the birds found in the Oneida Lake region with reference to their local distribution, abundance and habits as these features have developed in my studies. Attempt is made to compare briefly the Oneida Lake status of the bird with its status in the State generally and to mention items in its natural history and economic relations which are associated directly and specifically with conditions in the particular region. In most cases, diagnostic field characters as well as other items more or less generally known but which seem to be of value in making the report more interesting and readable, are included.

In view of the many nomenclatorial changes which have been proposed in North American ornithology since the third (1910) edition of the American Ornithologists' Union's Check-List of North American Birds was issued, and of the writer's uncertainty regarding the exact status of these proposed changes so far as the American Ornithologists' Union's Committee on Nomenclature is concerned—as well as of the nearness of publication of a new Check-List—some difficulty was experienced in choosing a satisfactory plan of procedure in an attempt to bring the scheme of nomenclature employed in this paper into conformity with recent acceptance.

After due consideration it has seemed best to employ here the system outlined by Dr. Alexander Wetmore in his recent paper entitled "A Systematic Classification for the Birds of the World" (Proc. U. S. Nat. Mus., Vol. 76, Art. 24, pp. 1-8, 1929), for the arrangement and terminology of the orders and families. This scheme is essentially the one that will be used in the fourth edition of the official Check-List now in course of preparation.

An attempt also has been made to bring both the common names and the technical names of the birds herein listed into line with what promises to be the generally accepted form in the next official Check-List. The arrangement and sequence of the species is somewhat at variance with most of the prevailing published systems.

The scheme of classification and arrangement of species employed in this paper has been made possible only through the generous assistance and courteous and timely co-operation of Dr. Witmer Stone, editor of "The Auk" and chairman of the American Ornithologists' Union's Committee on Classification and Nomenclature of North American Birds.

It will be noted that most of the changes in the well known and often long established common names have been brought down to date by the addition of some qualifying word which indicates the principal range of the bird, e.g., "eastern," "northern" or "southern."

In attempting to avoid redundancy and prolixity in the following pages these names are not always employed in their entirety, for where the form or geographic race of the species discussed has been mentioned in the complete common name at the head of each specific discussion in the annotated list, it is assumed that where the common name of that race again occurs the complete designation need not be indicated. Thus, under the treatment of the eastern robin, the designation having been indicated at the beginning of the discussion, the simple term "robin" is frequently used in the following paragraphs where it obviously refers to the form occurring in the Oneida Lake region.*

Acknowledgments. In a report of this type the author of necessity must be under obligation to a considerable number of individuals for services rendered, courtesies extended and favors granted.

Therefore I would first express my warm obligation and deep sense of appreciation to Dr. Charles E. Johnson, Director of the Roosevelt Wild Life Station, for having made this study possible and for his continued interest and helpful advice and suggestions during the prosecution of this investigation.

To Mr. Wilford A. Dence, Ichthyologist and Assistant Director of the Roosevelt Station, I am indebted for cordial help in securing many of the material items required in the pursuit of the field work as well as for certain information concerning the Oneida Lake region and for suggestions and aid in the preparation of the manuscript.

To Dr. Witmer Stone of the Academy of Natural Sciences, Philadelphia, I extend my sincere thanks for his aid in facilitating the preparation of this report from the systematic standpoint by furnishing information and notes regarding the present status of the A. O. U. Check-List so far as the species mentioned in this report are concerned.

My obligations are also due to Miss Miriam Mockford, Secretary of the Roosevelt Wild Life Station, for assistance in expediting the preparation of this report and for other considerations.

In carrying on the field studies which form the basis of this report, practical assistance of many kinds has been rendered by a number of residents in the Oneida Lake region and numerous courtesies have been extended by others as well. In this connection I wish especially to acknowledge the kindness of the following persons: Dr. Frank Andrews, Mr. F. J. Becker, Dr. H. P. Brown, Miss Eleanor Church, Mr. E. E. Dickinson, Mr. C. G. Green, Mrs. L. L. Jennings, Mr. I. O. Lamb, Mr. William Moss, Dr. J. F. Mueller, Mr. E. E. Nicholson, Mr. L. E. Partelow, Mr. Edmund J. Sawyer, Mrs. Katherine Van Antwerp, Mr. C. J. Warner and others. Recognition of other assistance is attested in its place in the body of this paper. And finally I wish to acknowledge the valuable assistance of my wife who accompanied me on many field trips, made numerous helpful observations and otherwise assisted materially in the preparation of the report.

*The new A. O. U. Check-List was issued while the present report was in press.

GENERAL DISCUSSION OF ONEIDA LAKE AND CONTIGUOUS TERRITORY

Geographical Location, Topographical and Vegetational Features. Oneida Lake, the largest body of water entirely within New York State, lies near the center of the Commonwealth, eleven miles northeast of Syracuse and twenty-seven miles southeast of Lake Ontario, in latitude 43° N. and longitude 75° W. Madison and Onondaga counties border the lake on the south, and Oneida and Oswego counties on the north. It extends almost due east and west for a distance of twenty-one miles while its greatest width is five and one-half miles. The east end of the lake, although not the widest part, is considerably wider than the west end which empties into the Oneida River. This lake is 369 feet above sea level. It is essentially a shallow water lake, the greatest recorded depth being fifty-five feet, toward the north shore and about one and one-half miles southeast of the village of Cleveland. Of the eighty square miles (51,200 acres) comprising the total area of the lake, sixteen per cent is less than twelve feet in depth. Except at points along the north side, the sixty-five-mile shore line is relatively low, and bordered, particularly at the east and west ends, by considerable expanses of shallow water and extensive wooded swamps, beyond which lie cultivated fields. An excellent hard-surfaced highway leads entirely around the lake so that its waters and shores are easily accessible for observation and study. The principal streams that empty into the lake are Chittenango Creek on the south side; Fish Creek, Oneida Creek and Wood Creek at the east end; and Big Bay and Scriba creeks on the north side. In addition some thirty other creeks of lesser magnitude flow into the lake.

With the construction of the Caughdenoy dam in the Oneida River as a part of the State Barge Canal system the water level of the lake was raised several feet and as a consequence large areas of land immediately surrounding the lake were flooded, thus adding to the previously established natural swamp areas in the vicinity of Maple Bay and Lower South Bay. Some of these large swampy tracts cover an area of from four to five square miles, while the largest of all, Cicero Swamp, lying about two miles south of the lake and more or less paralleling it, has an area of eight square miles. These extensive swampy expanses affect materially the bird population of the region.

The Barge Canal extends lengthwise through Oneida Lake, extensive dredgings having been made in order to permit as well as to facilitate navigation.

Briefly summarizing the topographic and vegetational conditions surrounding Oneida Lake we may say that the south shore is low, swampy and flat, and considerable areas within a distance of two miles of the lake shore are devoted to grazing and agricultural pursuits. In many places the original forest, except for isolated tracts here and there and immediately along the lake shore proper, has been cut down. However, these detached wooded tracts do provide unique conditions from the standpoint of bird distribution. Of late years also numerous summer camps have sprung up along this shore line which has come to be a great outdoor playground for the people of Syracuse and vicinity. The irregular,

more or less impenetrable swampy belt varying from a few rods to two miles in width and known as Cicero Swamp, still retains most of its original vegetation and separates the broad flat expanse near the lake from a like but more extensive area to the south; the latter extends farther south to the surrounding hills which represent the ancient lake shore.

The east end of the lake presents a broad sandy beach known as Sylvan Beach, where Fish and Oneida creeks deposit sands from the Medina sandstone area to the north. East of the beach proper the land is low and swampy and some of the original forest growth still remains. Farther away agricultural conditions prevail all through the valley.

Northeast of Sylvan Beach the topography becomes more rolling and gradually blends into the rough bowldery elements typical of north shore conditions along the east two-thirds of its extent. Although some of the land immediately adjoining the precipitous shores here is under cultivation, much of it is so rocky as to be suited only for grazing purposes. However, there are no rock outcrops either here or at other places along the lake shores which are composed of loose glacial and post-glacial deposits.

Extensive areas of mature forest are still to be found and it is a great delight to visit some of these beech and birch and hemlock tracts. Of course evidences of lumbering and subsequent burning are also apparent. The north shore west of Constantia, extending to the outlet of the lake at Brewerton, is again bordered with extensive low, swampy, wooded shores beyond which the land rises somewhat so that cultivation is possible. In favorable places summer camps have been erected on or near the lake shore, but they are less numerous in this section than in any other in the region.

It is at once apparent that rather different topographic and vegetational features characterize the north and south sides of this body of water, while conditions of a more or less intermediate type prevail at the broad east end. That these conditions are strongly reflected in the bird life which they support will be suspected, and this is warranted by the findings.

Geological Features. Oneida Lake occupies the bed of an ancient body of water and as a consequence its immediate shores are comparatively low and flat. The greatest elevations occur along the north shore near Cleveland where the almost precipitous banks rise from seventy to ninety feet above the lake level. In most places they are considerably lower.

The available geological evidence seems to point to the fact that Oneida Lake is of glacial origin. After numerous advances and retreats of the ice sheets during the Quaternary Period, the drainage in the meanwhile shifting from west to south and east, a great lake was formed, filling the Ontario basin and covering the area now occupied by Oneida Lake. This old lake drained into the Mohawk Valley. Later the ice sheet retreated and so permitted the waters to discharge into the great Hudson Valley. A depression in the southeastern lobe of this post-glacial lake, known to geologists as Lake Iroquois, became isolated from the main body of post-glacial waters and formed Oneida Lake as we know it today. The water-level of Lake Iroquois was over seventy feet above the

present level of Oneida Lake. The north shore line of the outlet of the old glacial lake lies about a mile north of Oneida Lake while the south shore of the outlet lies to the south and east of the city of Syracuse. Subsequently, when Lake Ontario was drained to its present level, the outlet of Oneida Lake shifted to the St. Lawrence drainage system and the lake drainage area is now said to include 1,265 square miles. A great deal of this area is low and swampy with considerable areas of sandy soil.

As a result of these shiftings there has been left a broad valley varying in width from ten to fifteen miles, with Oneida Lake lying at the bottom of the valley. Its more precipitous north shore lies a mile or thereabouts from the shore of its ancient precursor while the less declivitous south shore has withdrawn five to ten miles from the old lake outlet, with a wide stretch of low land, including the great Cicero Swamp, intervening.

According to Hopkins (1914, pp. 7-9) the rock strata around and beneath Oneida Lake are the Clinton-Rochester shales, comparatively soft rocks. Overlying these is the harder Lockport (Niagara) limestone. It is probable that previous to the arrival of the Illinoian and Wisconsin ice-sheets the bed of Oneida Lake was the wide flood plain of a pre-glacial river. These ice-sheets probably shifted the soft shale and re-deposited it in the form of moraines and drumlins, the crests of which doubtless form the numerous shallows and several small islands found in the lake at the present time.

Climatological Features. *Temperature, Humidity and Precipitation in the Oneida Lake Region.* Not only do temperature, humidity and precipitation play an important part in the vegetational features of any area, but also they are factors the action and interaction of which are reflected in the animal life found in that area. This is particularly true of birds whose activities and, indeed, well-being, are so closely associated with plant forms.

The climatological factors exhibited in the Oneida Lake region are conducive, in general, to forest growth although a considerable number of species of sedges, grasses and aquatic plants abound here. Owing to its comparatively shallow waters it seems likely that Oneida Lake itself exerts but little more than local influence upon the climate of the surrounding territory. Nevertheless the lake does appear to make its presence felt on the surrounding plant growth as well as on the local distribution of birds.

Detailed climatological data for the Oneida Lake region proper are not available, but the general climatic characteristics of the territory of which it is a part are included in the climatological report prepared by the United States Weather Bureau for Section No. 102 which embraces Central New York. The following extract is taken from the "Summary of the Climatological Data for the United States by Sections," Reprint of Section 102 for Central New York, and prepared by P. C. Day, Climatologist and Chief of the Division of Climatology in the United States Weather Bureau.

"Climatological section No. 102 includes that part of New York lying east of a line drawn south from Lake Ontario along the east boundary of Monroe County to the north line of Steuben County and north of a somewhat irregular

line that marks the ridge, or watershed, between the streams that flow southward into the Atlantic Ocean and those that flow northward into Lake Ontario and the St. Lawrence River west of the Champlain Valley.

"The climate of this section, which is mainly of the continental type, is modified by its varied topography and the proximity of the Great Lakes. The Adirondack Mountains, the main ridge of which, rising to a height of 3,000 to 5,000 feet above sea level, forms the eastern boundary of the section, present peculiar climatic features not found elsewhere in the State. The proximity of Lake Ontario, which borders the section on the north and west, exerts a modifying influence on the climate for a considerable distance inland, while the climatic conditions of the interior are probably more or less influenced by the numerous bodies of water, known as the Central New York Lakes.

"This diversity of climate, resulting from these varied topographical features, is intensified by the geographical position of the section, which places it in the path of storms that cross the Great Lakes and move down the St. Lawrence Valley. The sudden and at times extreme changes, brought about by the passage of these storms, many of which during the winter season are attended by severe cold waves, are characteristic of the climatic conditions for the entire section.

"The Central Lakes Region is a somewhat circular basin lying between the watersheds of the Salmon and Mohawk rivers on the east, the watershed of the Genesee River on the west, and that of the Susquehanna on the south. It is drained by the Oswego River, which is formed by the junction of the Seneca and Oneida rivers. The Seneca River drains nine lakes, viz: Canandaigua, Keuka, Seneca, Cayuga, Owasco, Skaneateles, Otisco, Cross, and Onondaga, which, with various small ponds and marshes, have a total water surface of 304 square miles. The Oneida River drains Cazenovia and Oneida Lakes, which, including marsh lands, have a water surface of about 218 square miles, making the total water area in this region about 522 square miles. While the presence of this water area does not appreciably modify the general climatic conditions of the region as a whole, the local influence of individual lakes is quite noticeable, especially when considered in connection with the prevailing direction of the wind . . .

"The average temperature for this region is about 47° and ranges from about 71° in July to about 24° in January and February. The average of the daily maxima is about 57° and of the daily minima about 38°. The highest temperatures usually occur in July and August, and frequently reach 95° and occasionally 98° or 100°. Temperatures of 90° or above occur from May to October, inclusive. January and February are the coldest months, with extreme temperatures ranging from 10° to 23° below zero. Temperatures of zero or below have been recorded from November to March, inclusive.

"The average annual precipitation for this region is about thirty-six inches, and ranges from about twenty inches in the driest years to near forty-eight inches in the wettest years. The average annual rainfall over the Seneca and Keuka Lakes watersheds, which are among the driest sections of the State, is slightly less than thirty inches. From Seneca Lake eastward the precipitation increases gradually, the approximate annual amounts for the watersheds of the re-

maining principal lakes of this region being as follows: Cayuga, thirty-four inches; Owasco, thirty-six inches; Cazenovia, thirty-eight inches, and Oneida forty inches.

"The average annual snowfall for this region is about sixty inches.

"The season between the last killing frost in the spring and the first in the fall averages about 164 days, the average date of the last spring frost being May 3 and the first fall frost October 14. Killing frosts have occurred in this region as late as June 9 and as early as September 11."

For the year 1928 the United States Weather Station in Syracuse gives the date of the last killing frost in spring as April 21, while on October 27 occurred the first killing frost of autumn. This permits a growing season of 189 days which is, I suspect, somewhat longer than the growing season at Oneida Lake and surrounding territory.

A summary of certain climatological items that are of interest from the viewpoint of the ornithology of the Oneida Lake region, is presented in the accompanying table. Details regarding temperature, precipitation, amount of sunshine and prevailing direction of the wind are given for the twelve months of the year. That the occurrence, abundance, times of appearance, or presence during the summer, and other details concerning many of the species of birds of the region, bear some relation to these items can not be doubted. The table has been compiled from the New York Section of Climatological Data, Volume 40, Numbers 1 to 12, and Volume 41, Numbers 1 to 12. The records were taken at the United States Weather Bureau Station in Syracuse.

TABLE NO. 11.—CLIMATOLOGICAL DATA—1928.

Month	Temperature in Degrees Fahr.						Precipitation in Inches			Number of Days				
	Mean	Highest	Date	Lowest	Date	Greatest Daily Range	Total	Greatest in 24 hrs.	Greatest Snowfall Unmelted	With Precipitation of 0.01 in. or more	Clear	Partly Cloudy	Cloudy	Prevailing Direction of Wind
January.....	28.2	51	15	6	21	39	1.25	0.26	8.8	18	2	5	24	w.
February.....	25.2	53	8	-5	26	27	1.88	0.47	7.7	18	4	6	19	s.
March.....	31.7	73	24	12	6	39	3.84	1.30	32.0	20	1	10	20	w.
April.....	42.4	80	6	24	16	30	3.26	1.12	9.7	16	4	11	15	n.w.
May.....	55.6	86	4	33	7	38	1.39	0.49	0.0	8	7	14	10	n.w.
June.....	63.1	83	25	44	3	28	3.96	1.12	0.0	17	4	11	15	s.
July.....	71.6	92	9	54	29	27	6.14	3.22	0.0	11	10	10	11	n.w.
August.....	71.8	90	4	53	13	28	4.98	2.51	0.0	15	6	14	11	s.
September...	58.5	84	12	36	26	34	2.28	0.86	0.0	11	5	17	8	s.
October.....	54.0	86	12	19	30	34	3.66	1.58	5.2	13	7	10	14	s.
November....	42.0	70	15	17	26	23	3.88	1.24	10.2	16	3	5	22	w.
December...	34.6	57	17	15	9	27	0.91	0.28	7.5	9	4	8	19	s.w.

TABLE NO. 12.—CLIMATOLOGICAL DATA—1929.

Month	Temperature in Degrees Fahr.						Precipitation in Inches			Number of Days				
	Mean	Highest	Date	Lowest	Date	Greatest Daily Range	Total	Greatest in 24 hrs.	Total Snowfall Unmelted	With Precipitation of 0.01 in. or more	Clear	Partly Cloudy	Cloudy	Prevailing Direction of Wind
January.....	24.9	62	19	2	14	41	2.96	0.44	27.8	22	1	10	20	s.w.
February.....	24.3	46	18	4	20	27	1.98	0.37	16.6	15	1	10	17	w.
March.....	41.0	68	23	10	10	34	2.51	0.45	6.1	16	2	13	16	s.
April.....	48.3	81	6	22	2	38	7.61	2.91	3.2	22	2	12	16	e.
May.....	56.4	90	30	35	10	33	3.61	0.96	T.	15	5	12	14	s.
June.....	66.8	90	12	41	6	30	1.33	0.36	0.0	8	11	13	6	s.
July.....	71.4	94	28	47	20	30	2.47	0.76	0.0	12	12	12	7	s.
August.....	66.2	88	22	49	20	32	4.26	1.85	0.0	8	12	9	10	..
September...	65.2	93	4	35	21	31	3.90	2.52	0.0	11	10	10	10	s.
October.....	49.8	77	20	28	10	29	3.45	2.27	T.	14	4	12	15	s.
November...	40.5	69	2	11	29	20	2.20	0.80	1.2	16	3	5	22	s.w.
December...	28.0	47	13	-3	12	36	3.33	0.90	21.1	21	2	5	24	s.w.

In order to present in somewhat greater detail the prevailing summer temperatures in the general region of Oneida Lake, the following tables, compiled from the published reports of the United States Weather Bureau Station in Syracuse, are submitted. This is the official station lying closest to Oneida Lake. It must be borne in mind that the temperatures at this weather station and at Oneida Lake probably differ somewhat, for not only does a distance of some eleven miles separate the two localities, and the lake itself probably exerts more or less local influence on the temperature in the lake region, but also the difference in altitude is considerable for Syracuse lies 597 feet above sea level while Oneida Lake is only 369 feet above that level.

However, it is probable that over a period of years the essential temperature differences would be slight and for the present purpose the maximum and minimum temperature readings taken through May, June, July and August, 1928 and 1929, at the Syracuse Station will meet the requirements. These months comprise the season of the year during which the field observations for the present report were made. The readings are given in the Fahrenheit scale.

TABLE NO. 13.—DAILY TEMPERATURE READINGS—1928.

Day of Month	May		June		July		August	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
1	60	49	76	53	79	58	80	67
2	59	45	64	51	81	63	87	68
3	63	47	62	44	87	62	86	75
4	86	57	60	45	83	72	90	75
5	83	45	57	50	75	65	79	68
6	51	38	70	54	78	59	77	66
7	53	33	67	52	85	59	81	64
8	64	35	74	52	91	69	83	65
9	72	47	76	55	92	75	80	65
10	74	46	59	45	83	67	84	64
11	68	47	70	51	81	66	70	61
12	48	39	78	54	76	61	71	54
13	54	35	83	63	77	58	81	53
14	57	38	76	63	78	65	83	61
15	67	41	61	50	78	61	89	67
16	72	46	67	46	81	66	90	66
17	70	57	76	48	86	67	73	67
18	71	55	70	61	84	71	79	68
19	70	60	67	62	76	69	73	59
20	72	59	73	61	69	59	78	55
21	70	56	65	58	75	55	81	65
22	75	51	71	58	73	66	74	63
23	55	46	75	62	78	65	76	60
24	54	41	76	61	77	64	78	64
25	57	43	83	65	79	65	71	63
26	63	48	76	61	80	58	72	62
27	66	45	71	59	74	63	83	61
28	68	45	79	58	78	59	87	72
29	58	47	75	58	69	54	80	66
30	60	49	70	60	70	56	82	64
31	65	48	..	..	81	54	68	56
Mean . . .	64.7	46.4	70.9	55.3	79.2	62.9	79.5	64.0

TABLE NO. 14.—DAILY TEMPERATURE READINGS—1929.

Day of Month	May		June		July		August	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
1	77	44	63	52	82	64	78	61
2	69	50	52	43	67	54	74	53
3	59	38	58	42	67	52	72	59
4	57	36	68	47	80	58	65	52
5	57	43	61	48	73	67	70	54
6	61	48	69	41	89	67	73	57
7	54	39	65	50	90	75	73	53
8	51	37	62	45	79	65	80	51
9	52	40	71	43	91	61	83	55
10	58	35	78	48	77	65	87	61
11	68	43	87	58	82	60	84	69
12	68	52	90	66	87	61	76	59
13	59	46	75	61	89	73	81	57
14	58	44	87	65	76	58	83	63
15	70	58	74	62	78	52	69	59
16	73	42	82	58	82	56	69	54
17	66	40	86	62	85	59	82	55
18	73	55	89	68	81	59	76	60
19	60	40	88	71	66	55	68	53
20	60	37	85	69	74	47	70	49
21	53	47	83	66	82	52	79	50
22	56	43	82	67	87	61	88	60
23	74	44	85	65	90	69	77	65
24	65	47	88	70	79	67	77	60
25	61	44	80	65	76	62	81	57
26	73	40	74	59	79	59	87	63
27	80	52	77	57	92	66	74	58
28	82	62	78	62	94	72	64	54
29	87	70	68	60	87	67	64	55
30	90	69	74	59	78	63	69	51
31	80	63	..	..	85	59	81	49
Mean....	66.1	46.7	76.0	57.6	81.4	61.5	75.9	56.6

Summarizing, then, it may be said that the considerable amount of annual snowfall and rainfall make for the maintenance of more or less swampy conditions on the low-lying land in the vicinity of Oneida Lake. Many streams flowing into it are active all summer and their banks support a heavy vegetation. These factors are conducive to an abundance of swamp- and marsh-loving species of birds. Unquestionably such species predominate here. On the other hand, too, the prevailing climatic factors make for a rather plentiful tree growth which, in areas where it has been unmolested by man, attracts many interesting woodland and arboreal species of birds.

Having now mentioned briefly certain aspects of local climatology and suggested the likelihood of their influence upon the fauna and flora of the region under consideration, it remains to discuss more specifically the influence of these factors over a more comprehensive area and to set forth the interpretations of this relationship as made by one whose words are authoritative on the subject. That the broader aspects of this interpretation are reflected in the situation about Oneida Lake can not be doubted.

Life Zones and Faunal Areas Represented in the Oneida Lake Region.

The distribution of plant and animal life on the continent of North America was worked out some twenty years ago by Dr. C. H. Merriam (1898) and since his proposals regarding such distribution are, with some slight modifications, now generally accepted, a brief resumé of the salient features of this scheme will be set forth here with special reference to their application in the Oneida Lake region.

A. **BOREAL REGION.** The entire northern part of the North American Continent from the polar seas south to near the northern boundary of the United States and within the United States occupies the higher parts of the Sierra-Cascades, the Rockies and the Alleghanies.

- a. *Arctic-Alpine Zone.* The far north beyond the limit of tree growth and, in the United States, high mountains above timber line. Characteristic birds are ptarmigan, snowy owl and snow bunting.
- b. *Hudsonian Zone.* Includes the northern part of the boreal coniferous forest from Labrador to Alaska. In eastern United States it is limited to the highest mountains from New England to western North Carolina. Characteristic birds are rough-legged hawk, pine grosbeak and gray-cheeked thrush.
- c. *Canadian Zone.* Includes the southern part of the transcontinental boreal conifer forest in Canada and parts of Maine, New Hampshire and Michigan; extends southward along the Appalachian highlands to western North Carolina and Tennessee. It is the zone of red spruce, balsam, fir, paper birch and mountain ash. Among the characteristic birds are the spruce partridge, Arctic three-toed woodpecker, Canada jay, white-throated sparrow, evening grosbeak, Blackburnian, Canada and magnolia warblers, winter wren and hermit thrush. In New York this zone is confined to the Adirondacks and Catskills, but straggling elements of it may be observed in the Oneida Lake region.

B. **AUSTRAL REGION.** Covers all of the United States and Mexico except the Boreal mountains and the tropical lowlands.

- a. *Transition Zone.* The eastern humid portion is called the *Alleghanian area*. Includes the northeastern states and part of the Canadian provinces and the Alleghanies from Pennsylvania to Georgia. It is the region of oaks, hickories and chestnut with mixture of the more northerly birches, beech, hemlock and sugar maple. Among the characteristic birds are Virginia rail, kingbird, crested flycatcher, bobolink, chipping and field sparrows, brown thrasher, house wren, long-billed marsh wren, wood thrush and Wilson's thrush. Both the flora and fauna of the Oneida Lake region are typical of those characterizing this zone.
- b. *Upper Austral Zone.* In the United States the eastern humid portion is called the *Carolinian area*. Includes the lower Hudson Valley, Staten Island and Long Island, the coastal region of New Jersey to the mouth of the Chesapeake Bay and the territory west and south to moderate elevations. It is the zone of tulip tree, hackberry, sweet gum,

black gum, persimmon, red bud and sycamore. Characteristic birds are fish crow, cardinal, prothonotary and blue-winged warblers, Louisiana water-thrush, Carolina wren and tufted titmouse. These elements are more markedly lacking in the Oneida Lake region than are those of the Canadian zone.

- c. *Lower Austral Zone*. In eastern United States the humid portion only is represented and is called the *Austroriparian area*. Includes the coastal plain from the mouth of Chesapeake Bay to Florida and the other Gulf States westward. It is the zone of live oak, magnolia, tupelo, loblolly and long-leaf pines and cypress. Characteristic birds are Louisiana heron, black vulture, ground dove, boat-tailed grackle, yellow-throated warbler and mockingbird. Not represented in Oneida Lake region.

C. *TROPICAL REGION*. Covers the southern part of Florida, most of Central America, the lowlands of southern Mexico and a narrow strip in extreme southwestern United States.

- a. *Tropical Zone*. In eastern United States confined to southern Florida. It is the zone characterized by the presence of royal palms, mangrove, mahogany, etc. Characteristic birds are American egret, reddish egret, everglade kite and mangrove cuckoo.

A brief consideration of the conditions prevailing in the Oneida Lake region will serve to show that it falls somewhat between the zones where on the one hand southern or austral conditions prevail to some extent and, on the other hand, where northern or boreal conditions are exhibited, that is, the so-called Transition Zone of Merriam. However, while this situation is true in general in the region, for elements of both Canadian and Upper Austral zones may be discerned, its topography together with its proximity to the ocean and the Great Lakes, to say nothing of the considerable expanse of local waters, cause its life zones to depart more or less from the standard set forth by Merriam where the basis for his zonal divisions rests upon latitude and theoretical temperature.

In order to meet this emergency and to carry the zonal distribution of Merriam still further, Bray (1915) attempts to describe more specifically the distribution of vegetation in New York State by means of "indicators," using trees of various species in this connection.

A much abbreviated form of his scheme follows:

STATE LIFE ZONES with INDICATOR TREE SPECIES.

A. *Zone of dominance of willow, oak, sweet gum, persimmon, short-leaf pine*. Growing season 190 to 200 days. Indicator species include short-leaf pine, black jack oak, willow oak, laurel magnolia and mistletoe. Not represented in central New York.

B. *Zone of dominance of oaks, hickories, chestnut, tulip tree*. Growing season 150 to 180 days. Indicator species include cottonwood, chestnut, hickory of several species, oak of several species, hackberry, flowering dogwood, wild black cherry, etc. Represented all about Oneida Lake but most pronounced on the south side.

C. *Zone of dominance of sugar maple, beech, yellow birch, hemlock, and white pine mixed forest: Alleghany-Transition Forest Zone.* Growing season 130 to 150 days. Indicator species include white pine, hemlock, yellow birch, hawthorn, choke cherry, basswood, white ash, sugar maple, red maple, beech, etc. Represented all about Oneida Lake but most pronounced on the north side.

D. *Zone of dominance of maple, beech, yellow birch, hemlock and white pine as in Zone C but with the addition of red spruce, balsam, paper birch, mountain ash, etc., especially at greater elevations.* Also further characterized by absence of oaks (usually), hickories, elms, chestnut, etc., and by the decreasing prominence of herbaceous plants on the forest floor. Growing season 100 to 130 days, more or less. Commonly occurs at elevations of 2,000 to 3,700 feet in New York State. Faint suggestions of this condition prevail in a few places on the north side of Oneida Lake.

E. *Zone of dominance of red spruce, balsam and paper birch.* Not represented in central New York. Catskills and Adirondacks.

F. *Zone of Arctic flora of Adirondack peaks.* No arborescent plants. Typical of summit of Mt. Marcy and other peaks of the Adirondacks.

In the following more detailed accounts of certain typical bird habitats that occur in the vicinity of Oneida Lake, the zonal characteristics of the region will be somewhat elaborated, particularly with reference to the dominant species of birds.

DESCRIPTIONS OF SELECTED TYPICAL BIRD HABITATS IN THE ONEIDA LAKE REGION

Since Oneida Lake together with the various types of habitat and vegetation occurring in its immediate vicinity offers the principal attractive influence for the birds of the region, and since the vegetation is more or less modified in conformity with local conditions dependent directly or indirectly upon the lake itself, it was thought best to limit for the most part the field of our operations and observations to points within a distance of not more than three to four miles from the lake shore proper. In a few instances where particularly interesting or unusual ecological conditions in the region prevail outside this zone, observations were made at such points. However, for the most part the field stations include various types of habitats, open fields, woodlots, swamps and beaches, heavy and cut-over forests and the like in the immediate vicinity of the lake.

With the establishment of surfaced highways about the lake a good deal of public interest concerning it has sprung up in the past few years, and summer camps, cottages and fish-fry stands now occupy many of the easily accessible places about its shores. While this interest in the lake and its environs has thus been created the semi-cultivated conditions and clean-up campaigns that frequently go hand-in-hand with the establishment of living quarters in a more or less primitive territory act as deterrents to some kinds of birds. However, to other species such changed conditions seem to be agreeable and the numbers of such may remain fairly constant or become greater.

In attempting to present a picture of the local conditions a number of typical habitats in the region have been selected for consideration in some detail of their topographical, vegetational and other features. It is hoped that with these as a background the occurrence and distribution of the bird fauna of the region may be better understood. Particular attention has been given in this respect to the bays, points, islands and immediate shore conditions of the lake proper as well as to conditions that prevail farther away. Beginning at Lower South Bay and vicinity these habitats are discussed more or less in the order of their geographical position, proceeding east to encircle the lake via Bridgeport, Lakeport, South Bay, and Sylvan Beach which lies at the eastern extremity of this body of water. Next in order, proceeding north and west, the following north-side districts are considered: North Bay, Jewell, Cleveland, Bernhard Bay, Constantia, Shaw Point, West Monroe and Big Bay. Finally, the islands of the lake receive attention.

Lower South Bay and Adjoining Districts. Since more than half of our field work was attempted from headquarters near Lower South Bay it might be suspected that this district received undue attention from an ornithological viewpoint. However, the fact remains that the proximity of this place to the two largest islands of the lake, its bowldery lake shore, low in some places, high in others, its protected bays and coves, its rows of summer camps and cottages many of whose owners take an active interest in birds, its open meadows and cultivated fields stretching away southward to Cicero Swamp and eastward to Chittenango Creek, as well as its unique and interesting patches of isolated beech, maple and hemlock woods—all these unite to give here a fairly good ornithological cross-section of the entire south shore of the lake.

In the vicinity of the terminus and station of the Syracuse, Watertown and St. Lawrence River Railroad (electric) the shore of Lower South Bay reaches its highest point where it rises perhaps twenty feet above the normal level of Oneida Lake. At only a few other points along the south side of the lake do the immediate shores attain so great an elevation.

At the "trolley station," the banks of the lake support a rich growth of vegetation chief among which is water willow and dogwood. Near the water, sedges and cat-tails are abundant and blue-flags and yellow water lilies grow in the water which forms a sort of bayou from the lake proper and is separated from it by a long, low, narrow peninsula of land directed eastward. The quiet waters prevailing here in this cove are visited frequently by ducks of various species, the most common one being the scaup (May), and by the horned grebe (May) and pied-billed grebe (July). Spotted sandpipers, red-winged blackbirds, bronzed grackles and Maryland yellow-throats are also frequent visitors at this point.*

From the trolley station Lower South Bay extends to the west and north and is bordered in general by an extensive and extremely low, swampy willow- and maple-clad shore line. Most of the original vegetation has been cut down so that now only a great array of decaying stumps add their melancholy bit to the scene. Toward Short Point which intervenes between Lower South Bay

* Maryland yellow-throat or Northern Maryland yellow-throat throughout—Northern yellow-throat of A. O. U. Check-List, 1931.

and Short Point Bay, the willow and maple growth is especially profuse on the swampy flat that extends from a few yards to more than a mile west of the lake shore proper, and is under more or less water until about mid-summer or even later when most of the swamp dries up. Two small streams meander through the swamp to empty their waters into the Bay. Bitterns, green herons, downy woodpeckers, swamp sparrows, yellow warblers, Maryland yellow-throats and veeries all find abundant food and some of them nesting sites in this locality.

Similar conditions prevail at Short Point Bay and at Long Point farther north. The latter is a narrow pointed strip of low, swampy land about 250 yards in width at its base and three-fourths of a mile in length. It, too, is bordered on both sides by shallow bays filled with vegetation mainly in the form of water willow (*Dianthera*) and bulrush (*Scirpus*).

A mile north lies Muskrat Bay, the south side of which limits the great wooded swampy area continuous with that on Long Point. Elms and white oaks make up the dominant large tree growth while willow thickets also are abundant in the low flat country bordering the bay.

From Norcross Point, which marks the southeastern extremity of Lower South Bay and on which is situated the fine home of the Syracuse Yacht and Country Club, the lake shore is moderately high and its general trend is in a southeasterly direction until Maple Bay is reached, when it becomes much lower, except at Shackelton Point, and assumes more of an east-west direction. Between Maple Bay and Delmarter Bay, two miles east of Bridgeport, the shore line is featured by a series of well-marked bays and points. Eastward the shore line as well as the back country is, with few exceptions, low, and but one major extension of land, Lewis Point, is directed into the waters of the lake.

The lake shore itself from Norcross Point southeast to Boysen Bay presents a narrow bouldery beach which rises abruptly to the grassy flat immediately adjoining and on which maples and elms are scattered here and there around the numerous cottages and nearby farmhouses. Occasionally an old apple orchard is to be found where starlings and northern flickers nest, while about the houses and buildings purple martins, tree swallows, barn swallows, robins and Baltimore orioles feed and nest in numbers. Purple finches, vireos and warblers of many species occur in the tall trees, and white-crowned and white-throated sparrows frequent the low vegetation planted either for beauty or utility. In the open fields marsh hawks, meadowlarks, bobolinks, song, vesper and Savannah sparrows and occasionally a Henslow's sparrow add both pleasing sound and color to the scene. And in the low wooded tracts still farther away the ring-necked pheasant, ruffed grouse and woodcock occur, together with many species of the smaller land birds. All in all the district offers a variety of attractive habitats to a considerable variety of birds.

The well-kept golf course of the Syracuse Yacht and Country Club lies to the south of the clubhouse and its grassy greens and fairways offer still further inducement to birds.

At Boysen Bay a sand beach of some proportions invites bathers, but the numerous cottages and the usual bathing-beach features do not make for an

attractive bird habitat, although spotted sandpipers and phœbes sometimes brave the crowds to feed by or to bathe in the waters of the bay.

Still a little farther southeast, Maple Bay with its attendant low shore line and, as the name suggests, extensive growth of tall maple trees, presents some features attractive to birds; but the human visitors to this locality during the summer months preclude, for the most part, any considerable concentration of birds here.

The adjacent land all along this extent of the lake is low, open and mostly cultivated or semicultivated, with numerous small isolated wooded tracts, and farmhouses disposed at more or less frequent intervals. Often an orchard of an acre or more in the vicinity of farm buildings proves to be an attraction for bluebirds, northern flickers, robins and starlings. The ubiquitous English sparrow is a very common bird of this district. Other birds that find favorable nesting sites in this open country are the bobolink, meadowlark, vesper, Savannah and chipping sparrows, barn and cliff swallows and purple martins.

Van Antwerp Woods. As previously mentioned, the south shore of the lake is low and flat and much of this territory is given over to grazing and agriculture. This means that much of the forest and other vegetation has been destroyed. However, it is interesting to note that here and there small areas of original woodland have been permitted to remain more or less intact. These tracts are often well isolated from one another by considerable stretches of cultivated land, but the species of birds that are attracted to such situations are, for the most part, different from those on the adjoining cleared sections (Fig. 118). Such variation in local distribution of birds is of peculiar interest from the standpoint of bird ecology.

A good example of this condition is afforded by the "Van Antwerp Woods," a tract of perhaps eight acres located a half mile south of the lake shore at Lower South Bay. It is entirely surrounded by meadows and cultivated fields. A paved highway which carries heavy automobile traffic extends along its entire west side, while a country dwelling house and the usual out-buildings stand opposite it a hundred feet away.

The forest itself is the typical beech-maple type; a few birches and ashes are intermingled with the hemlocks that make up the remainder of this woodland. Some of the trees are very tall. The ground is poorly drained, with numerous small elevations between which are depressions carrying water from a few inches to eight or ten in depth. Ordinarily these pools do not dry up until mid-July so that the woods are continually moist.

Sufficient light does not penetrate to promote a substantial undergrowth but ground hemlock and ferns grow well in some places. Other smaller plants come in as the season advances.

During the season, warblers of many species, thrushes, vireos and other lovers of moist woodland frequent this attractive spot and some remain to nest.

McClanathan Woods. A mile northeast of the village of Sylvan Beach and lying on low, sandy, and, for the most part, more or less boggy ground be-

tween the New York, Ontario and Western and the Lehigh Valley railroad tracks is a wooded expanse of several acres known locally as the "McClanathan Woods." An automobile highway intersects the tract.

Among the trees, maple and hemlock predominate, with now and then a larch and some white pine and birches, especially in the more open places. In the lower portions of the area near Fish Creek, red oaks and white oaks occur; some of them are of good size. Even in mid-summer pools of stagnant water still remain in the deeper parts of this woodland.

Parts of the area have been cleared of the mature timber within the past few years and in such situations aspen, bird cherry, high-bush blueberry and ferns of various species now form the chief plant growths. About mid-July the fruit of the blueberry and bird cherry begins to ripen and at this season great numbers of cedar waxwings, robins, song sparrows and catbirds visit this and similar districts to feed.

In low places formidable alder thickets prevail and all through the woods dense growths of maple saplings and bracken make penetration on foot rather difficult.

Southeast of this woodland tract, near Fish Creek, a broad sandy flat grown up into willows, coarse marsh grasses and broad-leaved cat-tails has been formed through continuous dredging of the Barge Canal in order to maintain therein an open channel for boat traffic. This accumulation of dredged sand has resulted in flooding on some of the low land near the lake, including parts of the McClanathan Woods.

Such woods as those first described under this locality serve as nesting and feeding places for the chickadee, oven-bird, Louisiana water-thrush, redstart and veery.

Isolated Wooded Tract Near Clay. Another small isolated wooded area so characteristic of the low flat country on the south side of Oneida Lake and comprising perhaps ten acres, lies one-fourth mile southwest of the village of Clay, immediately east of the Watertown and Rome Branch of the New York Central railroad. At this point the land is rolling and a small creek with its several tributaries meanders through the lower parts of the tract. Some small vegetation consisting of birch and maple seedlings, ferns and high-bush blackberries forms a cover in the moist woodland. Pools of water occur at frequent intervals, many of which do not dry until mid-summer, others not at all.

Beech, hemlock and maple make up the principal trees, and some of the beeches are very large. Birch, wild black cherry and a few white elms and shag-bark hickories comprise a smaller proportion of this woodland. Seedlings and saplings of these trees occur abundantly in the more open places of the tract where cutting has occurred from time to time. All around it are rolling meadows and cultivated fields. A similar but smaller wooded tract lies a few hundred yards to the southwest.

Birds characteristic of such places in July are the cowbird—which frequently deposits its eggs in the nests of the red-eyed and yellow-throated vireos also occurring here in numbers—as well as the chestnut-sided warbler and Mary-



Fig. 119. Looking north on road through Cicero Swamp near Hall Island.
May 26, 1928.



Fig. 120. Cicero Swamp near Hall Island.
Habitat of white-throated sparrow and
Canada and magnolia warblers. May
26, 1928.



Fig. 121. Buckwheat field near village of Cicero. The seeds are a favorite food of English sparrows, eastern goldfinches and other granivorous birds. August 15, 1928.



Fig. 122. Low open meadow and plowed field near Hall Island. Habitat of prairie horned lark, pipit and eastern Savannah sparrow. May 9, 1929.

land yellow-throat which frequent the high-bush blackberry thickets at the edge of the woods. The redstart and oven-bird are perhaps the two commonest species in the woodland proper, their notes being heard here all through the breeding season, while the veery is of not infrequent occurrence.

Wright Woods. A half-mile south of the Van Antwerp woods is another isolated hemlock-beech-maple-elm tract about five acres in area, known as the Wright woods. It is boggy and less dense than the Van Antwerp woods, and high-bush blackberry, black raspberry and elder form a rather dense undergrowth in some places.

Cicero Swamp District. One of the most unique localities of the region as well as one of special ornithological interest is the large swampy area which extends all along the south side of Oneida Lake from Bridgeport west to a point two miles west of Brewerton, lying at distances varying from one and one-half to six miles from the lake and known as Cicero Swamp.

A more or less definite but broken and irregular extension of this swamp continues east from Chittenango Creek, two miles south of Bridgeport, almost to the city of Oneida about seven miles southeast of the village of South Bay on Oneida Lake. The two main parts of the swamp proper are more or less separated from each other by the higher land south of the village of Cicero. Along this series of "islands" and ridges extends the principal highway which leads north from Syracuse through Cicero to Oneida Lake and points north. Following a meandering and, in many places, an ill-defined course through the swamp, some two miles east of Cicero is Mud Creek, which follows in general a westerly direction and with its numerous small tributaries feebly drains the swamp, its waters finally reaching the Oneida River near Oak Orchard. The eastward extension of the swamp is drained in some measure by Black Creek the waters of which finally reach Oneida Lake through Chittenango Creek and by the lesser Canaseraga and Cowaselon creeks and their tributaries, together with a few other streams of lesser magnitude. About two miles directly south of Lower South Bay on the south side of Oneida Lake, in the midst of the swamp, are two well-marked knolls called Hall Island and Long Island. They are really elongated knolls of land each of several acres extent and their vegetation and bird life in general differ considerably from that found in the swamp a half mile away (Fig. 120).

"During the glacial period the erosion by the ice and the glacial waters further lowered the shale areas (Clinton-Rochester) south of the limestone (Lockport-Niagara) outcrop, causing a depression in which the water stood after the melting of the glacier, thus producing the flooded area of Cicero swamp and the westward extension of the flooded area in the Montezuma swamp district." (Hopkins, 1914.)

Walking in this swamp is exceedingly difficult during most of the late spring and summer period, owing to its boggy condition and the lack of drainage on the one hand and the dense growth of vegetation on the other. In some places pools of water two or three feet in depth intervene between grass or sphagnum

hummocks; in other places the larches and "swamp" spruce, both standing and down, are so thick and intermingled with other dead and living vegetation that headway is almost impossible without some danger and an extraordinary amount of physical exertion. On this account but three widely separated but more or less typical parts of the swamp were investigated, and brief descriptions of these must, of necessity, fulfill the present requirements.

The swamp in the vicinity of Hall and Long islands is low and boggy, with pools of water here and there, and supports a dense growth of red and black spruces and tamarack. The drier hummocks are covered with waste from these trees in the form of bark, twigs and cones. Between and on some of the hummocks, sphagnum moss grows abundantly. Small streams and bogs are of frequent occurrence in the lower parts of the swamp so that it is difficult to make headway here. Clearings have been made in places through the swamp for surveys and high tension electric lines, but such areas soon become grown up with aspens, elms and maples. All along the edge of the swamp the ground is grassy and hummocky, with maples and elms growing in profusion. Cultivated fields (Figs. 121 and 122) and pastures join the swamp immediately on both north and south sides. A graveled highway, used principally by the local inhabitants of the district, extends by way of Hall Island and Long Island through the swamp (Fig. 119). Farm houses and the usual outbuildings are disposed at rather distant intervals on the higher ground along both north and south sides.

South of Bridgeport the swamp partakes of a somewhat different character although it maintains its moist and hummocky characteristics. Here maples, elms and birches predominate so far as trees are concerned. A few scrubby cedars occur, with now and then a tamarack or spruce. There is a good deal of undergrowth, mostly elderberry and ferns of different species, *Pteris* predominating.

Quite a different type of vegetational conditions and avian population prevails in that portion of the swamp lying one and one-half miles southwest of the village of Clay and about six miles southwest of South Bay, the nearest part of Oneida Lake.

Here the Syracuse and Rome branch of the New York Central Railroad crosses the swamp, which may be entered and inspected from the vantage point of the tracks which lie some ten to fifteen feet above the normal water level of the swamp.

On either side of the railroad track and extending for more than two miles in a northeast-southwest direction, the flat marshy area is grown up thickly with narrow-leaved cat-tail and marsh grass. A great amount of arrow arum and swamp loosestrife grows along the edges of Mud Creek, which meanders sluggishly through the swamp, and about the small open pools of water in the marsh, particularly north of Mud Creek. The borders of the larger pools are surrounded by rank growths of cat-tails. During the summer months a great amount of duckweed floats on the surface of the creek and adjoining pools of water.

A few willows and maples are scattered through this part of the swamp but they are rather sparse in the immediate vicinity of the railroad tracks. Farther away many dead trees and stubs of larger trees that have decayed or been broken by the wind are to be seen, and still farther to the east and west long stretches of maple and elm woods occur in the swamp. Small willows and a considerable amount of red-osier dogwood together with other low bushes and vegetation grow near the tracks and in the shallower parts of the swamp as well as along the banks of Mud Creek. Numbers of old muskrat houses are to be seen in the swamp, which is a favorite trapping ground for these valuable fur-bearers. Common nesting birds in this unique district are the least bittern, green heron, black duck, Virginia rail, Florida gallinule, mourning dove, swamp sparrow, long-billed marsh wren and bluebird.

The immediate territory affords a broad expanse of almost impenetrable — except by boat—marsh land, very thickly grown up with cat-tails. Both north and south of the swamp the ground rises gradually, and considerable areas of tillable and pasture land lie in this district.

While the bird fauna of a swamp is always of peculiar interest it seems to me that such an area affords less opportunity for variation in its fauna than does a forest area. Perhaps the extreme uniformity of conditions that prevail in the swamp are accountable for this state of affairs.

Hitchcock Point District. From the standpoint of ornithological field observations one of the most productive localities on the south side of the lake was Hitchcock Point and contiguous territory, particularly that lying immediately west of the mouth of Chittenango Creek. We visited this district frequently during May and early June for it is a favorite feeding and congregating place for many species of warblers; and nests of woodcock and great horned owl were found here. Other commoner nesting species were the mourning dove, bronzed grackle, song sparrow and tree swallow.

Hitchcock Point is a low, broad extension of land lying a little more than two miles northwest of the village of Bridgeport. It is divided into an east and a west portion by Chittenango Creek which empties into Oneida Lake near the apex of the point. Maple Bay borders it on the west and Froher Bay on the east. From Maple Bay a swamp, partly wooded, partly open, extends well toward the point itself.

The territory immediately west of the mouth of Chittenango Creek and near the lake shore supports a dense growth of tall maple trees interspersed among which are elms, ashes and white oaks (Fig. 123). The ground is low and swampy and at high levels of the lake it is largely inundated. Between this woodland and the west bank of Chittenango Creek is an extensive grassy flat; a part of it near the hardwoods is covered by a dense alder thicket (Fig. 129). Between this and the creek bank are two shallow ponds bordered by willow, alder and red-osier dogwood. Scores of red-winged blackbirds nested here. A few white thorn trees, elm and maple seedlings, willow and other low bushes grow on the flat, while along the banks of the creek cottonwoods and maples form the principal tree growths. There is little undergrowth in the denser part of the woodland.

Not only here but also in other places where willow, alder, white thorn and other shrubbery as well as smaller vegetation flourishes, the maximum of foliage growth and concealment for birds afforded by it is attained by mid-July. Indeed, in the woodland at this time some of the more delicate plants have begun to fade and wither a little. From that time on, plant foliage in general diminishes gradually.

On the east side of the creek lies the major portion of Hitchcock Point where elms and maples, some of very large size, make up most of the tree growth. This area is low, grassy and swampy and extensive growths of willow occur in many places. Small undergrowth in the way of marsh grass, ferns and maple and elm seedlings affords cover for numbers of birds. The beach along Froher Bay is restricted and sandy.

South of the point the country all around is low and more or less open and marshy, with considerable expanses of grassy meadows and cultivated fields—a typical farming community with its attendant homes, outbuildings, orchards and the like. Here the kingbird, bobolink, meadowlark, Savannah and vesper sparrows, barn and cliff swallows and a host of other birds ordinarily found in such situations, including the starling, feed and rear their young.

Shackelton Point and Delmarter Bay Districts. About one and one-half miles northeast of Bridgeport, on the south side of Oneida Lake, the bold outlines of Shackelton Point project into its waters. To the southeast of the point lies broad Delmarter (Briggs) Bay.

Shackelton Point proper rises perhaps twenty to twenty-five feet above the level of the lake and presents a narrow pebbly beach along the immediate shores of which willows grow in abundance as well as in the low, boggy grass flats south and southwest of Delmarter Bay. Near, and in the water on the east side of the point, and nearly all along its west side as well, is a thick growth of sedges which affords a feeding place for green herons and bitterns. The high flat area immediately south of the point supports a considerable number of tall maple trees, and a few summer cottages face the lake. West of Shackelton Point the beach is bowldery and more or less precipitous. Sedges grow in the shallow water near shore, and a narrow strip of woodland—largely maples, but there are some elms and shag-bark hickories—intervenes between the shore line and the open cultivated district that stretches away to the south for two or three miles. Southeast of the point, toward Delmarter Bay, the shores of the lake become lower and the back country for some distance is low and marshy with rather dense growths of willows along a small creek which flows into the lake. Low willows also grow in clumps in the open grassy fields here. Marsh grass and flags are the predominant small vegetation on this low-lying flat. A few areas of broad-leaved cat-tails also are found here, but they are of small extent.

Along the south shore at Delmarter Bay are tall maples, but this wooded area is limited. The west shore supports a few oaks, mostly white oaks, while dogwood and alder grow along the fence rows and the creek. Along with the willows they afford a considerable tangle where black-billed cuckoos, yellow

warblers, Maryland yellow-throats and catbirds find food, nesting sites and a retreat from enemies and the elements.

Extending eastward from Delmarter Bay is a long, bare though narrow, sandy and pebbly beach which adjoins open meadows (Fig. 131). The shore line here is from three to four feet above the normal water line of the lake and the flat beach is but a few yards wide.

In the open fields south of Shackelton Point the bobolink and Savannah sparrow occur in numbers (Fig. 132). The low, grassy, willow-clad flats nearer the point support numbers of breeding mourning doves and swamp sparrows in addition to the species previously mentioned. The lesser yellow-lags was also discovered breeding here. Red-eyed and warbling vireos as well as cedar waxwings frequent the higher wooded ground near the point, while barn and cliff swallows breed about the barns and other outbuildings of the adjoining rather sparsely settled farming community. Spotted sandpipers in numbers visit the sandy beach east of Delmarter Bay, and I once saw a flock of fourteen semi-palmated plovers there.

The Bridgeport and Lakeport Districts. Lying a little over a mile from the south shore of Oneida Lake and about midway of its east-west extent is the village of Bridgeport. Chittenango Creek meanders through the west side of the village. Five and one-half miles east of Bridgeport is another small village, Lakeport, which lies only a quarter of a mile from the lake shore. Six miles farther east is the village of South Bay, almost at the lake shore and on a line with the east end of the lake itself.

The country immediately surrounding these villages and stretching away to the swamp which parallels the lake shore and lies from two to four or five miles south of it, is low flat and boggy for the most part. A considerable proportion of it is suitable for grazing only, but cultivated fields of some extent also are found. Areas of hummocky land supporting a dense growth of marsh grass occur in many places and afford suitable nesting habitats for the marsh hawk and short-billed marsh wren. Isolated wooded tracts of elm, maple, oak and ash are common and along Black Creek which runs through the east and west extent of the swamp are extensive bogs and hemlock-maple woods, with some birch and an occasional hackberry or sycamore. Here the conditions prevailing in the deeply wooded sections on the north side of the lake are simulated and such birds as the red-shouldered hawk, scarlet tanager, oven-bird, water-thrush, Canada warbler, redstart and veery are found breeding, though not so abundantly as in the more extensive north-side woods.

A cat-tail marsh of similar proportions lies about three miles southeast of Bridgeport. The long-billed marsh wren and American bittern breed here.

Extensive clearings along the edge of the swamp three miles southeast of Lakeport have been made and many acres of fine vegetables are grown on the rich muck soil thus made available for intensive farming. In the recently cut over sections where cultivation has not followed the clearing, aspens and wild cherry have appeared. Willow bogs and alder thickets prevail in moist situations.

On the south side of Black Creek and the great swamp just mentioned the topography becomes more rolling and the ground sandy. Again, more heavily wooded country greets the eye. Great numbers of dead chestnut trees are to be found here and the conditions, in general, are similar to those in the vicinity of Oak Orchard some five miles southeast of Brewerton.

Lewis Point District. Lewis Point, a well-marked extension of land into the lake a mile northwest of the village of South Bay, presents a flat and sandy, though not extensive beach. The immediate territory is low, flat and boggy, with a fairly heavy growth of trees, elms predominating, and some of them very large. Maples, beeches, birches and willows also abound here, but there is little undergrowth.

Sylvan Beach District. Since the only extensive sand beaches on Oneida Lake are found at its eastern extremity this district is of more than passing local interest. Unfortunately, from the standpoint of the plant and animal life of the region, such natural attractions as a broad sandy lake beach affords to birds are favored by the human population as well, with the result that some of the terrain has been modified and a good deal of the original vegetation has been cut down. A great array of cottages and summer camps and an amusement park with its attendant lights, noises and other distracting features have sprung up in recent years, and during the summer months, the beach proper becomes a vast amusement and recreation place. This beach is visited by a greater number of people than is any other place about the lake, and on this account fewer birds gather here than might otherwise be expected. However, even with all these disadvantages it has not lost all its natural beauty and interest for it is still attractive to certain species of birds that are seldom seen anywhere else about the lake, while some types of vegetation of the region are confined almost exclusively to this district.

While the name "Sylvan Beach" is sometimes employed to refer to the entire extent of exposed sand beach at the head of the lake, I shall use it in a more restricted sense to indicate the beach expanse north of the Barge Canal, from the village of Sylvan Beach to a point about a half-mile north of the village. From thence on north almost to the village of North Bay I have designated the shore line as Oakland Beach, which is also a term of more recent application. For the exposed beach south of the Barge Canal to South Bay I shall use the old local term "Verona Beach." The linear extent of these three more or less confluent beaches is approximately four miles.

During normal summer stages of water level the north half of Verona Beach (Fig. 133) presents a flat sandy expanse varying in width from a few yards to perhaps fifty yards; it becomes narrower farther to the south and all along it slopes back very gradually to the wooded area adjoining on the east. The waves strike against this beach with some force, washing up refuse (dead fish and other débris) so that an enticing feeding place for gulls and shore birds in particular is afforded. Small pools of water occur in many places along the beach and in and around these sedge growth is rather sparse (Figs. 135 and 136).



Fig. 123. Maple woods and hummocky swamp. Maple Bay district. Habitat of marsh hawk. May 4, 1928.



Fig. 124. Maple Bay hardwoods. Habitat of eastern winter wren, Louisiana water-thrush and swamp sparrow. May 4, 1928.



Fig. 125. A short inlet stream at Maple Bay. Habitat of common black duck and eastern green heron. June 28, 1928. (Photograph by W. A. Dence).



Fig. 126. Mud Creek near village of Cicero. Habitat of American bittern and eastern red-winged blackbird. June 25, 1927. (Photograph by W. A. Dence).

The extreme north end of the beach is more extensive and it becomes thickly overgrown with sedges and willows as the season advances. Farther south where the waves wash it clean the beach proper is a favorite place for bathing during the summer, and automobiles carrying picnic and bathing parties frequently are driven to the water's edge (Fig. 137). Despite these disruptions gulls and shore birds of several species are frequent visitors to these sandy stretches, and some of them are almost constant occupants.

Immediately east of the beach the terrain is low and rises only from one to perhaps four feet above the lake level. Cottages and summer camps occupy considerable areas near the beach toward its south extremity, but are situated at a somewhat greater distance immediately south of the Barge Canal.

From thirty-five to one hundred yards east of the beach and practically paralleling not only Verona Beach but also Sylvan Beach proper, extends a fine concrete highway, and a little farther east of this are the tracks of the New York, Ontario and Western and the Lehigh Valley Railroads. The entire district is low and swampy and is drained by Oneida and Black creeks with their several smaller tributaries. However, during wet seasons and particularly during late spring and early summer much of this area is under water; sometimes a foot or more covers the highway in places.

Hemlock-maple woods and a few birches and white oaks form the prevailing tree growth on the low boggy ground along Black Creek. The maples are mostly tall and slender. Blueberries and ferns grow abundantly in open places in the woods.

A mile east of Verona Beach is a high, sandy, wooded area where large pitch pine, white pine, white oak and red oak trees make up the principal growth. In the cut-over areas small white birches, aspens and pin cherry are common. Natural reforestation may be observed in these tracts in the way of small pitch and white pine trees that have sprung up. A rather dense thicket of blueberry and fern provides food and retreats for a good many birds in late summer.

Sylvan Beach proper, i. e., that part of the sandy beach lying north of the Barge Canal, is somewhat narrower than Verona Beach except immediately opposite the village of Sylvan Beach. Here a broad, low, willow-grown sandy expanse with numerous shallow pools again offers enticement to aquatic and semi-aquatic species of birds (Fig. 138). A little farther north numbers of fine cottages are built close to the lake shore and birds do not visit this narrower beach so frequently. Still farther north the terrain becomes lower and the exposed sand beach less extensive until it is lost in the sedge-grown mud and gravel flats of North Bay and environs.

Extensive groves of maple occur on the low flats just east of Sylvan Beach, while farther away hemlocks, elms, birches and ashes predominate, and in open places where clearing has been undertaken thick growths of willows and alders occur. Dense growths of poison ivy are not infrequent, and in many places a thick undergrowth of miscellaneous vegetation offers concealment and nesting places for song sparrows, towhees, Canada warblers and Maryland yellowthroats.

From a point about three-fourths of a mile north of the village of Sylvan Beach to the extreme northeast corner of Oneida Lake the lake shore and immediate vicinity is known locally as Oakland Beach. The land here is low and flat, with many tall maples near the beach which is sandy but very narrow. East of the State road which lies 100 yards or more from the beach is a considerable area of second-growth maple with some birch and hemlock intermingled. A considerable amount of undergrowth also occurs here. The Maryland yellow-throat nests here in greater numbers than in any other restricted area about the lake.

A half mile east of the extreme northeast corner of Oneida Lake is an extensive low, flat, marshy meadow along the east side of which is a vast white birch and alder thicket, a somewhat different type of growth than prevails in most places about the lake. Although the white birch is the prevailing type of tree growth here, none of the trees are large. Some willows also have taken root in this boggy expanse through which progress on foot is difficult. Alder and yellow-bellied flycatchers, Canada warbler, redstart and veery are typical inhabitants of the depths of this thicket.

Almost a mile due east of the village of Sylvan Beach and 200 yards southeast of Fish Creek station on the New York, Ontario and Western Railroad is a swampy district, much of it grown up in cat-tails, arrow arum and willows and surrounded by dense alder thickets. Numerous small exposed areas of open water on which duckweed floats in abundance occur in this swamp, which reminds one of a small-scale replica of the great cat-tail marsh in the Cicero Swamp southwest of the village of Clay. Bitterns, herons, Virginia rails, red-winged blackbirds and swamp sparrows are characteristic birds of this district.

Northeast of the station the land is a little higher, and a forest of maple, beech and hemlock adjoins the tracks. More red oak occurs in this vicinity than elsewhere in this part of the lake region.

"The region around the eastern end of Oneida Lake represents in the character of its arborescent vegetation a close relationship to the Alleghanian-Transition zone. Upon the sandy areas which are not covered by swamp or marsh vegetation the principal trees are: white pine, hemlock, pitch pine, white oak, red oak, white birch, yellow birch, ... black oak, wild black cherry, ... bird cherry.

"In low wet situations (swamp-forest) the principal trees are: red maple, yellow birch, tupelo or black gum, elm, silver maple, basswood, swamp hickory, swamp white oak, striped maple, red ash, ... black ash, cottonwood.

"There is not lacking, however, a good representation of shrubs and herbs very characteristic of the Canadian-Transition zone, the most noteworthy being the following: bush honeysuckle, true wood-sorrel, partridge-berry, wild sarsaparilla, ... Canada violet.

"It is interesting to note that for the most part these species of the Canadian-Transition zone are inhabitants here of dense woodlands, while the larger element of Austral shrubs and herbs is mainly in open places—low, sandy plains and the depressions in the sandy plains—open marshes, swamps and shores.

"The broad, sandy beach along the eastern shore of Oneida lake, together

with the sandy plains, depressions, open marshes, and sandy fields, in which the water level is often close to the surface and which frequently lacks well-defined surface drainage, together with a climate modified to some extent by the prevailing winds from the Great Lakes, is favorable to the development of a large Austral element in the vegetation..." (House, 1918, pp. 63-65).

Some of the principal items of this Austral element are, ground pine, long sedge, whip-grass, panic grass of several species, knotweed, dewberry, low Juneberry, paniced dogwood, cottonwood, squaw huckleberry and flat-topped golden-rod.

While both Canadian-Transition and Austral vegetational elements are evident in this more apparent Alleghanian-Transition zone the bird life of the district also reflects some of this overlapping of zones. Canadian-Transition avian elements are represented by breeding Blackburnian and Canada warblers and by the hermit thrush while at least one Austral avian element is represented by the breeding Louisiana water-thrush.

Fish Creek near Village of Fish Creek Landing. This large creek here flows in a southwesterly direction through a broad, level valley. A great deal of boggy grass land lies along its course in this vicinity. In some places the sandy banks of the creek extend in the form of low, flat beaches (Fig. 145) while at other places sand borders rise vertically five to fifteen feet above normal water level. In late June the isolated ponds which occur here and there along its shores and for some distance away therefrom represent the remnants of the old creek bed which shifts from time to time during high waters. At such times the ponds become filled, but later they temporarily lose their connection with the creek; direct communication is reestablished during periods of high water.

Immediately along the creek banks willows form the predominant tree growth. Elm, hackberry and shag-bark hickory occur frequently. Hemlocks are rare. In the back waters, vegetation in the form of water willow, duckweed, arrow-arum and both yellow and white water lilies grow in some profusion, offering hiding- as well as feeding- and nesting-places for such birds as the black duck, green heron, red-winged blackbird, Maryland yellow-throat, yellow warbler and yellow-throated vireo.

Near the village of Fish Creek Landing the creek itself is about forty yards wide, the village lying on one side and open pastures on the other. Opposite the village on the north side of the creek is one of the most extensive nesting sites of the bank swallow that I have ever seen (Fig. 207). A good many willows grow along the low south bank, but opposite this and extending for a half-mile or more up-stream the precipitous sandy banks rise ten to fifteen feet above the water. Portions of the bank slump down from time to time but only a narrow strip of earth remains near the water line, for the sand that has thus fallen is soon carried away lakeward by the stream. Other extensive bank swallow nestings occur along the vertical sandy shores farther up-stream (Fig. 208).

North Bay District. The country north of the village of North Bay is rough and hilly, much like that farther west. Boggy wooded areas are com-

mon, and hemlock, elm, aspen, butternut, maple and wild black cherry are the principal trees in such places. In the lower marshy situations alder and willow thickets prevail. These wooded tracts have been comparatively little disturbed and the redstart, oven-bird, black-throated green and other warblers nest in their depths, while on their outskirts the kingbird, towhee, field sparrow and indigo bunting are common nesting forms.

Northeast of North Bay village about one and one-half miles is an extensive cedar bog, the densest and wildest which I visited on the north side of the lake. Only one other such extensive cedar bog occurs near the north shore of Oneida Lake and that lies a mile south of the West Monroe cemetery. I have never found these cedar bogs of particular ornithological interest. Woodcocks are said to occur in them but I saw none.

West of the village of North Bay is an extensive cut-over area typical of the many found in the Oneida Lake region. The ground is distinctly boggy, and aspens are the dominant tree growth, with small white pines, maples and pin cherries interspersed among them. In addition, considerable areas of high- and low-bush blueberry, Juneberry, fern and other bushy vegetation offers excellent feeding and hiding places for such birds as the Baltimore oriole, song sparrow, field sparrow, towhee, cedar waxwing, brown thrasher, catbird and robin (Fig. 150).

The lake shore in the vicinity of North Bay is a low, flat expanse bearing an abundant growth of marsh grass and sedges (Fig. 144); the latter extend for some distance into the water, affording good feeding and hiding places for bitterns. A little way from the beach is a dense growth of tall willow trees. Just north of the New York, Ontario and Western Railroad tracks, which closely follow the shore line at this point, is an extensive grass and alder bog. Many small aspens also occur here.

The Cleveland District. Cleveland and vicinity are of particular ornithological interest for several reasons:

1. The immediate country is high, rolling and rocky for the most part. It is also much more heavily wooded than most places on the south side of the lake.
2. Some of the largest and finest beech and hemlock forests in the Oneida Lake region, still untouched by fire or the ax, lie in this district.

Among the conifers, aside from hemlock, white pine predominates especially in areas from which the original growth has been removed for some time. Cedars occur in abundance in boggy places, while an occasional tamarack also may be encountered in such situations. Other hardwoods in addition to beech are maple, elm, white oak and birch. In low places ash and shag-bark hickory occur regularly, and dogwood is not rare; at the edges of woods the wild black cherry and aspen often make up a noticeable proportion of the forest growth.

The abundance of hemlock-beech-maple woods offers suitable and frequently chosen nesting sites for such birds as the redstart, oven-bird, black-throated green and black-throated blue warblers (Fig. 148). It is



Fig. 127. Wright woods, Lower South Bay district. Hemlock-elm-beech with undergrowth of blackberry, raspberry and elderberry. July 17, 1928.



Fig. 128. Maple woods on low flat at mouth of Chittenango Creek. May 28, 1928.



Fig. 129. Alder thicket, west side of mouth of Chittenango Creek. Habitat of Canada warbler and northern Maryland yellow-throat. June 11, 1928.



Fig. 130. Willow flats along south side of Chittenango Creek near its mouth. May 11, 1929.

here, also, that the suggestions of Canadian zone elements in the local avifauna are most pronounced.

3. Considerable cut-over areas with their new stands of maple, elm, white pine, wild cherry and aspen seedlings and saplings are to be found, as well as expansive tracts of brushy and bushy land grown up into wild blackberry and raspberry, high- and low-bush blueberry, ferns and other small vegetation.
4. Boggy creek bottoms occur not infrequently about Cleveland. Parts of these are grown up into grass and are more or less hummocky, and others into hemlock, birch, maple, elm and alder. Dense thickets composed solely or mainly of alder often grow in the swampy, somewhat open creek bottoms extending through hemlock-maple woods. Such situations are especially frequented by the Canada warbler, while in the open country that may adjoin such conditions the bobolink, meadow-lark and Savannah sparrow often occur in numbers.
5. Extensive sandy fields occur a short distance east of the village of Cleveland. Also near it are large sand pits which are worked throughout the summer. Here and at other small sand and gravel pits and in the precipitous banks of the lake shore as well, the belted kingfisher finds suitable places for its excavations.
6. The lake shore is generally bouldery and precipitous. Comparatively little beach expanse is exposed even at low lake levels.
7. Although the ground is boggy in many cleared as well as wooded places, there are no extensive swamps such as the Big Bay and Cicero swamps. Numerous small alder- and willow-bordered streams follow the valleys and empty their waters into Oneida Lake, but there are no large water courses here such as Oneida and Chittenango creeks on the south side of the lake.
8. As a whole the district is less thickly populated than many others of the region, and numbers of abandoned farms and farm buildings are to be found throughout the forested parts. As a rule the cleared areas devoted to agriculture are comparatively smaller than the farms on the south side of the lake. In many places parts of the farms have been permitted to grow up into wild blackberry and other low vegetation, which offers feeding places and nesting sites for field sparrows, indigo buntings and chestnut-sided and yellow warblers. The concentration of human population occurs in the villages near the lake and along the State highway that closely parallels its north shore.

Between Cleveland and West Vienna (Jewell) the terrain is low, sandy and open to the south of the track of the New York, Ontario and Western Railroad which parallels the State highway and the lake shore lying a half-mile south of the track. Immediately north of the railroad right-of-way are partly cleared areas now grown over with bushes (Fig. 147), while a little farther away and, in some places immediately adjoining the railroad property, hemlock-maple-beech woods prevail. Near West Vienna a thick growth of willow and alder follows the course of a small stream that partly drains a swamp lying about

two miles north of the village and flows through Mud Pond, a mile north of it, to empty its waters finally into Oneida Lake. A good many large maples and some willows occur in the village itself which is furnished with an abundant bird population as are all the villages about the lake.

For practically the entire distance of four miles between Cleveland and West Vienna and even beyond to North Bay, the lake shore rises more or less abruptly from the water's edge and there are no well-marked bays or points. In a few places small mud beach expanses permit a growth of bulrush and willow, but for the most part such areas are insignificant and the beach is largely pebbly. A considerable number of summer camps have been established along the lake shore here.

Extending south of the track to the bluff at the lake shore is a sandy flat partly cultivated and partly in meadow. One portion of the flat is traversed by a shallow meandering creek with precipitous sandy banks in which a considerable number of bank swallows find suitable sites for burrows. The banks of an extensive sand pit a mile northeast of Cleveland also furnish nesting sites for these birds.

Just east of Cleveland the lake shore is high, rising between eighty and ninety feet above the lake level. A very narrow coarse sand and gravel beach is exposed here, but the shore, which supports a growth of red and white oak, ash, shag-bark hickory and a few sycamores, rises abruptly from the water. A mile east of the village the immediate elevation from the beach is not so pronounced.

While small farms are scattered in the high flats all along the north side of the lake between its waters and the heavy woodland in the hilly country a mile to the north, one of the cut-over wooded and brushy areas so prevalent in this vicinity, which is located about one and one-fourth miles northeast of the village, will serve as a type for such conditions.

This tract, some fifty or more acres in extent, a part of the holdings of Mr. Bernard Delahunt, a local resident, is sandy soil. Mr. Delahunt works an extensive sand pit on a part of it during the summer months, the sand being used in the manufacture of glass. The topography is slightly rolling and the ever-present bogs and swamps prevail in spite of the sandy nature of the soil. The tracks of the New York, Ontario and Western Railroad pass through this holding.

Many years ago the original forest growth was cut down and in its place have come maple, white pine, and pitch pine, aspen, and wild cherry of two or three species (Fig. 159). There is an occasional tamarack and a dead or dying chestnut tree. Thickly interspersed with this larger growth is a dense undergrowth of high- and low-bush blueberry, junberry (*Amelanchier*) and wild blackberry, together with saplings of most of the trees just mentioned. Of the still smaller vegetation, fern, wintergreen and dewberry make up the bulk. Several small ponds occur here, and moss grows abundantly near them and in the moist parts of the woodland.

In mid-May many of these trees and shrubs are in bloom, and when in middle and late summer their fruits attract a host of birds this and other similar

areas become great feeding centers for flickers, Baltimore orioles, brown thrashers, song sparrows, catbirds, cedar waxwings, robins and many other species.

To the west of Cleveland the immediate lake shore rises a few feet above the water line, and the country lying farther to the north is flat and marshy until the wooded areas still farther north are reached. The exposed beach is very narrow and bowldery, and a little grass grows in the shallow water. Between the shore and the State road a few hundred yards away is a narrow strip of maple, ash, linden, wild black cherry and shell-bark hickory woodland where the red-headed woodpecker occurs more consistently than anywhere else in the entire region. At the village of Bernhard Bay, two miles farther west, the beach is low, bowldery and sandy for a short distance only; sedges and coarse grasses grow thick along the sandy part of the beach which is several yards wide here. Still farther west the shore is somewhat higher all the way to Constantia, although at no place does it reach the height found east of Cleveland.

One of the most notable properties in the Cleveland district and one that will serve to illustrate in somewhat greater detail the conditions that prevail in the vicinity, is "Vandercamp," a vast, mostly wooded expanse of some 1200 acres and owned by Mr. F. C. Soule. This gentleman permitted me to wander freely over his property, a part of which has been cleared and furnished with a number of fine homes and other buildings, as well as a nursery of trees and shrubs. Near the buildings other more or less extensive improvements have been made in the way of clearing of stream beds and construction of trails, bridges and dams; but for the most part the vast estate is largely in a natural condition, having been little if at all molested. A natural lake about three-eighths of a mile in diameter lies near the buildings; woodland surrounds this body of water, which sinks to a low grassy alder and willow marsh at one end. A half mile farther west another natural lake has been enlarged and beautified, while a third but smaller lake is also on this estate. These bodies of water are attractive to herons and bitterns and to the black duck and belted kingfisher in particular. The entire place is really a game preserve and refuge that offers many advantages, both natural and artificial, to breeding birds. Such efforts as Mr. Soule has made toward their encouragement and protection could well be emulated more generally.

The topography is rolling, even hilly in places, and the soil is more or less bowldery and rocky. The side hills and valleys are boggy, and of course there is a great amount of moist woodland. Most of the larger forest is of the beech-maple-hemlock-birch-elm type, with a moist forest floor covered with ferns, wintergreen, and in places ground hemlock and moss (Fig. 146). Along the creek bottoms—several small streams flow through the estate—alder and willow grow in profusion. In some of the open cleared places white pine, wild cherry, birches and aspens are coming in. Such places afford breeding havens for several species of warblers and thrushes.

In some parts of the estate maple, elm and beech predominate, with a sprinkling of hemlock and birch. Along the edge of such wooded tracts clearings have been made in some places, and here maple and elm seedlings and saplings, together with an undergrowth of dewberry, wild blackberry and raspberry, high-bush blueberry and wild cherry seedlings, entice the Maryland yellow-throat,

catbird, black-billed cuckoo, Nashville and chestnut-sided warblers and field sparrow. Brush heaps scattered over the clearings provide refuge for song sparrows and towhees (Fig. 149).

Some expanse of open meadow sloping away southward to the lake shore a mile distant provides nesting facilities for meadowlarks, bobolinks and Savannah sparrows. About a fine set of farm buildings, now abandoned, some low-lying ground is cultivated. The buildings themselves offer nesting sites for phoebes, barn swallows and cliff swallows. And in the dead chestnut and dead and dying cottonwood trees about the buildings flickers, starlings and bluebirds find acceptable quarters.

As a matter of fact it is at once evident that the number of favorable nesting places in the wild wooded districts here on the north side of Oneida Lake is greater than in the more open situations that characterize the south side of the region under consideration. A corresponding difference in the bird faunas of the two sides of the lake is also to be noted, particularly during the nesting season.

Outlying Ponds and Lakes of the Cleveland District. *Panther Lake and Vicinity.* Some nine miles northwest of the village of Cleveland and seven miles north of Bernhard Bay and accessible by an excellent surfaced highway extending over high, rolling ground, covered for the most part with fine beech-maple-hemlock-birch woods, lies Panther Lake. The region is hilly and the lake lies in a broad, shallow valley. It is about a mile in length by three-eighths of a mile in width and is almost rectangular in shape. Both the north and south shores are wooded and somewhat rugged, although this feature is more pronounced on the higher south side where the immediate shores support a heavy growth of trees; aspens, white birch, maple and wild cherry predominating. Farther away the terrain slopes gradually over partly cleared areas supporting growths of small aspens. Open grassy meadows occur here, too, where the bobolink, meadowlark and Savannah sparrow nest. At the west end of the lake is an extensive grassy bog where small hemlocks together with birch, maple and ash are abundant. Immediately at the lake shore here, and along the north bank as well, are dense growths of sedges. At the east end of the lake is a small settlement and amusement place, while a number of cottages are scattered all along both north and south shores. Trails lead here and there about the district but the only passable roadway extends along the east end and a part of the north and south sides of the lake.

The north shore of this quiet body of water (Fig. 154) is of particular ornithological interest. Among the trees in the immediate surroundings, aspens and birches predominate near the water but farther away maple, beech, hemlock, ash, white pine and white oak form the dominant growth. Little clearing has been done in recent years and the woods have again become rather dense with, in many places, a tangle of undergrowth composed of ferns, wild raspberry and wild blackberry bushes along with saplings of some of the above-mentioned trees. Pools of water occur frequently in the more deeply shaded portions of the woods, even in late July; there are also many decaying, moss-covered logs in such situations. Alders grow so thick in low places along the lake as to form an

almost impassable barrier to human progression. This district is the highest of any visited by us in the Oneida Lake region; it lies 599 feet above sea level.

Here in this comparatively little frequented area are likely nesting places for the yellow-bellied sapsucker, black-throated blue, black-throated green, magnolia, Blackburnian and hooded warblers, redstart, red-eyed vireo, winter wren, chickadee and hermit thrush.

Kibby Lake. Still another outlying body of water that is of interest is Kibby Lake (Fig. 156), which lies some two miles northeast of the village of Constantia and about six miles northwest of Cleveland. The surrounding country is hilly, heavily wooded and sparsely populated.

The lake itself occupies a circular depression and is about three-eighths of a mile in diameter, with gently sloping south shores covered with a dense growth of maple, birch and hemlock, together with a few beeches, cottonwoods and white pines. Low hemlocks are the principal trees along the north shore, which is low and boggy, and there is a good deal of undergrowth in the way of ferns and ground hemlock. Moist, decaying and moss-covered logs are common in this dense woods. A small creek flows into the east end of the lake where an occasional tamarack occurs as well as a great thicket of water willow that encroaches upon the expanse of the lake proper. The west shore of the lake (Fig. 157) is wooded and lies only a few yards from the highway which carries a small amount of traffic. There are no old stumps of trees projecting above the waters of the lake nor is there any beach flat.

Such birds as the belted kingfisher, barn and tree swallows, magnolia warbler, oven-bird, Canada warbler, redstart and hermit thrush frequent this vicinity in numbers.

Gordon Pond. This small, shallow body of water lies four miles northeast of the village of Cleveland. It is surrounded by low hills that support a dense growth of typical hemlock-beech-maple forest (Fig. 214). By mid-June the water becomes more or less stagnant. Willow and alder grow abundantly all about the margin of the pond, and a few pond lilies dot its surface. From an ornithological viewpoint the item of particular interest concerning this body of water is the array of old stumps projecting from three or four to twenty or more feet above the water. The cavities in these afford nesting places for numbers of tree swallows. Kingfishers, too, perch on the stumps and the dead branches projecting from them, as they scan the water beneath for a passing fish.

Francis Pond. In the rough, hilly, heavily wooded country about four miles northwest of Cleveland lies Francis Pond. In many respects it is similar to Gordon Pond which lies four and one-half miles due east. Francis Pond is about one-half mile long and about one-fourth mile wide at the most. Its banks are precipitous and in the woodland surrounding the pond maples predominate although beech, hemlock, elm and wild cherry are fairly common. A great many old stumps of trees which afford points of vantage for kingfishers and provide nesting sites for tree swallows rise above the surface of the pond (Fig. 155). Numbers of great blue herons also feed here. Both white and

yellow pond lilies grow plentifully in places and there is an abundance of floating duckweed.

Constantia Bay, Bullhead Bay and Baker Point Districts. On the north side of the lake, just west of the main part of the village of Constantia, are indentations of the shore line which form the boundaries of Constantia Bay; adjoining it on the west but separated from it by a small point of land is Bullhead Bay, the western boundary of which is Baker Point which also forms the eastern boundary of Baker Bay.

From Constantia the shore line slopes away in a southwesterly direction. A quarter-mile from the lake the terrain is covered with coarse marsh grass; the immediate vicinity of the lake shore is low, flat and more or less boggy, with a thick growth of willows and in places of alder. Bird cherry and high-bush huckleberry (*Gaylussacia*), together with low- and high-bush blueberry grow in profusion in the cut-over open country a short distance from the lake shore. Not much of the latter is exposed and for the most part it is bowldery although a small mud-sand beach occurs along the east shore of Baker Point. The latter rises from ten to fifteen feet above the water. Maples and shag-bark hickories are the two prevailing types of tree growth at the point. A considerable part of the low lake shore proper between Baker Point and Constantia supports a growth of tall maples while sedges grow abundantly in the shallow water. A few summer camps are scattered along the shores at Bullhead Bay and Baker Point.

Such birds as the woodcock, spotted sandpiper, kingbird, crested flycatcher, wood pewee, cedar waxwing, yellow-throated vireo and veery frequent this district in search of food, and several of these and also other species nest here.

Phillips Point and Johnson Bay Districts. One and one-half miles west of Baker Point a broad extension of land is directed south into the waters of Oneida Lake. It is known as Phillips Point; the broad Three Mile Bay intervenes between the two points, while just northwest of Phillips Point a narrow arm of the lake known as Johnson Bay further indents the already heavily incised north shore of the lake.

While the entire district is more or less low and swampy the Phillips Point district forms a long narrow "island" on which, so far as trees are concerned, white oaks and shell-bark hickories predominate. Along the lake shore the usual maples and willows occur abundantly. The beach itself is pebbly but of considerable extent. To the north of the point is an extensive wooded swampy area more or less directly contiguous, toward the west, with the vast Big Bay Swamp which supports a growth of maples, birches and some white pine as well as a dense undergrowth of shrubbery and ferns.

Such birds as the great blue and green herons, black duck, blue-winged teal, oven-bird, Canada warbler and wood thrush breed here in comparative seclusion.

Shaw Point and Shaw Bay District. Forming the extreme southeastern boundary of Big Bay and the less extensive Paddygut Bay is Shaw Point, with the small but well-marked Shaw Bay lying immediately east of it. Shaw Point forms one extremity, the southwest, of the arm of an inverted V of high land

while Phillips Point forms the southeast arm. The body of this "island" extends in a northwesterly direction; on either side of it is a vast expanse of gloomy and swampy woodland coextensive with the Big Bay Swamp lying to the east.

The west shore of Shaw Point is pebbly while a low mud shore is exposed on the east side. A little north of the point the sparsely wooded banks rise gradually. The region of the bay is low, flat and swampy. The predominant trees are elms, maples, ashes and birches together with a goodly number of shag-bark hickories. A considerable expanse of shallow, stagnant back-water forms a sort of bayou. It is thickly grown up with scrub willows and some alder and offers retreats for ducks, herons and other water-loving birds. Bulrush (*Scirpus*) grows in some abundance along the lake shore.

A half-mile north of the lake shore an extensive growth of white oak, elm, maple and ash, together with some chestnut, mostly dead or dying, covers an almost impenetrable boggy area continuous with the Big Bay Swamp. Even in late June pools of water of considerable size and from two to four feet in depth occur. Duckweed is abundant on the surface and arrow-arum grows in profusion around the edges of the pools. Here occurs an extensive nesting colony of the great blue heron.

This area is not thickly populated; nor is it visited often by outsiders, so it serves as a quiet and comparatively safe breeding and feeding retreat for ducks in particular. Messrs. Gale and Shaw, owners of much of the land at and immediately adjacent to the point, have established a private park here for the propagation and protection of birds and fur-bearing animals. These gentlemen are to be commended for their interest and efforts in such matters.

A mile northeast of Shaw Point is a long "island" with a great grassy marsh to the east which affords a vast nesting expanse for bobolinks, Savannah sparrows and marsh hawks. The immediate territory west of the island is a reedy cat-tail marsh where bitterns and red-winged blackbirds hold forth, while beyond this the low, boggy, practically impenetrable woodland is coextensive with the great Big Bay Swamp, the local breeding stronghold of the great blue heron.

West Monroe District. About one and one-half miles southwest of the village of West Monroe, near Toad Harbor, is located one of the most extensive grassy marshes on the north side of the lake. A rough, graveled highway leads through it to Shaw and Phillips points. Grassy hummocks are interspersed at frequent intervals along the edge of the marsh, and cat-tails and marsh grasses of two or three kinds grow in the shallow water while duckweed is distributed in abundance on its surface. Bitterns, Virginia rails, swamp sparrows and long-billed marsh wrens nest here in numbers.

Just west of this marsh is a boggy wooded area. Beeches, maples, hemlocks and birches are present and together with a few scattered wild cherry trees make up the larger vegetation (Fig. 158). Aspens are common in the more moist places. A dense growth of ferns and poison ivy covers the forest floor, and arrow-arum is a common plant in the pools of water. The wood pewee, crow, Louisiana water-thrush, Maryland yellow-throat and veery frequent this locality during the nesting period.

To the north of this series of lowlands and marshes, which is continuous with the vast swamp north of Phillips and Shaw points, the terrain is rolling and hilly. On these uplands the prairie horned lark and Bartramian sandpiper occur sparingly, while the bobolink, meadowlark, Savannah and vesper sparrows are met with more frequently.

Still farther north the original woodland, largely maple, has been cut comparatively recently, and willow and aspen have taken its place. Beyond this the typical maple-beech-hemlock forest generally prevails.

Big Bay, Big Bay Creek and Adjoining Districts. As suggested by the name "Big" Bay, this broad arm of water forms the largest indentation of the lake. It lies a mile northeast of Brewerton and extends another mile to the north. On the east side of Big Bay a vast permanently swampy area occurs, the result of flooding brought about by the construction of the Caughdenoy Dam, a part of the State Barge Canal system.

The east shore of Big Bay is low and marshy and broken up into a number of "points." Sedge growth is dense in the shallow water near shore, affording hiding and feeding places for grebes, ducks and other aquatic and semiaquatic birds. The north shore (Fig. 162) also is low and swampy, but the west shore and territory back of it (west), although somewhat higher than the east shore, presents some low swampy areas near the bay, while a mile from it considerable expanses of more elevated, rolling ground are encountered. From the road three-fourths of a mile north of Emmons' Woods, on July 16, 1928, I attempted to traverse the swamp immediately northwest of the head of Big Bay, but the going was so difficult that I was forced to abandon the effort. Ferns and arrow-arum grow in profusion on the forest floor which is very boggy and mostly covered with water; this, with the mud beneath, makes human progression almost impossible. The most marked extension of land into Big Bay from the west shore is Milton Point, a low, narrow, wedge-shaped area covered with water when the lake is high.

Big Bay Creek follows a tortuous course for more than a mile into the swampy wooded area on the east side of Big Bay. At its mouth the creek is about six feet deep and twenty to twenty-five feet in width, but the depth varies in other places from three to ten feet until finally, upstream, the creek seems to become lost in the swamp itself. Where it maintains a definite course it is narrow, and its banks are encroached upon, in July and August, by a dense growth of miscellaneous vegetation which includes swamp loosestrife, arrow-arum, cow lily, black willow and dogwood. Pondweed (*Potamogeton*) floats in abundance on the surface of the creek.

A half-mile northwest of Big Bay Creek is another somewhat smaller stream known as Little Bay Creek that empties from the wooded swamp into Big Bay. Its course is even more tortuous than that of Big Bay Creek, and the overhanging vegetation more luxuriant (August 10). At one point a shore excursion was made for a hundred yards from the boat, but walking is exceedingly difficult in the oozy swamp. As in the vicinity of Big Bay Creek, the principal trees in the swamp are maple, elm and white oak. In other respects the two creeks and their immediate environs are similar.



Fig. 131. Gravel beach at Delmarter Bay. Feeding ground for spotted sandpiper and semipalmated plover. July 13, 1928.



Fig. 132. Reverted grassy field, Delmarter Bay district. Habitat of bobolink and eastern Savannah sparrow. July 12, 1929.



Fig. 133. Looking north along Verona Beach. August 13, 1929



Fig. 134. Looking north along Oakland Beach. September 9, 1927. (Photograph by T. L. Hankinson.)

Most of the swamp is wooded, second growth maple, ash and elm predominating. Water occurs everywhere, sometimes in considerable areas and again in smaller pools from two to three feet in depth. Here and there are small hummocks on which grow sapling maples, white oaks and ashes, either singly or in clumps. There are a good many dead maples upon which great blue and green herons perch in some numbers.

The whole swamp exhibits a rather dismal and gloomy appearance. However, while its almost impenetrable depths suggest coldness, isolation, discomfort and solitude to man, it seems to prove attractive to the great blue and green herons, black duck, hawks of two or three species, the bald eagle, kingfisher, crested flycatcher, red-winged blackbird, catbird and other species of birds (Fig. 164).

On a knoll of high ground a mile northeast of Milton Point and about a half-mile from the northeast shore of Big Bay is situated one of the typical isolated wooded tracts, so common in the region, and known locally as Emmons' Woods (Figs. 151 and 152). It is perhaps fifteen acres in area and consists in the main of hard maples, beeches and hemlocks, with a few elms, oaks, ashes, birches and white pines. The trees in the densest part of the woods exclude most of the light and the undergrowth. Warblers, vireos and thrushes occur here commonly in late spring and some remain to breed. On the morning of May 21, 1928, a dozen species of warblers including the cerulean, Cape May, bay-breasted and black-poll were discovered here within a short space of time.

Just north of this tall maple-beech-hemlock forest, the knoll slopes away to the maple swamps of the Big Bay district. On this declivity a thicket of maple, beech, birch, ironwood and ash saplings makes its bid for bird visitants. In this part of the woodland a small colony of green herons finds suitable nesting sites. Farther west the land is more or less open and used for farming and dairying.

Another extension of swampy land projecting into the east side of Big Bay about a mile northeast of Brewerton is a low, flat area called Coble Point. Small maples grow in abundance on the southwest side of the point. A few elms, oaks and ashes are intermingled with them. The northeast side is open and supports a growth of marsh grass and low willows. In the lowest place, from which water is seldom if ever absent, an extensive cat-tail marsh affords feeding and breeding places for the American and least bitterns. A liberal growth of sedges and arrow-arum occurs in the shallow water along the low mud beach, only a very small portion of which is exposed above the waters of the bay.

A few hundred yards east of Coble Point and the bay the land rises a little but for the most part the adjacent land offers too little drainage for cultivation so that marshy meadows are the rule. In such places Wilson's snipe is of common occurrence.

In addition to the birds mentioned this district serves as a breeding and feeding place for spotted sandpipers, kingbirds and song and swamp sparrows. Robins frequently nest in the willows and maples and both cliff and barn swallows visit the place in numbers for food and nest materials.

Oak Orchard District. This rolling and sandy district exhibits numerous sand and gravel pits along and near the Oneida River. The stream here presents

in many places low, flat banks thickly clad with willows and offers a situation paralleling, in some degree, the conditions which prevail near Fish Creek Landing at the east end of Oneida Lake. Bank swallow burrows are numerous in the steep inclines of these sand and gravel pits and the chatter of the kingfisher is often heard in the vicinity.

Mixed beech, maple and hemlock woods occur on the hills rising from the river bottom, while farther away cultivated fields and meadows are encountered. In the open sandy territory immediately bordering the woods the wild strawberry is a common plant, and the dewberry (*Rubus procumbens*) is more abundant than I have observed it elsewhere in the region. Among its intertwining, prickly, prostrate stems the vesper sparrow nests in numbers; I have not observed such a concentration of nesting birds of this species elsewhere in my field work here. Song sparrows also nest in such situations, and field sparrows find suitable nesting places in the bushes along the edge of the woods. The scarlet tanager is of rather frequent occurrence in the woodland near the river, and the monotonous song of the red-eyed vireo is heard on every hand. The lisping note of the cedar waxwing is also frequently heard.

Crossing Oneida River by way of Schroepfels Bridge and proceeding north, numerous dead chestnut trees are encountered in the more or less rolling country. Here and there considerable tracts of these trees also occur, all victims of the fatal blight disease which has destroyed practically all the chestnut trees of the region. The bare, gaunt limbs of these trees present a rather weird appearance against the green foliage of the beech-maple-hemlock forests which occur generally in the district. Considerable numbers of the white-breasted nuthatch were met with here, and I believe that it breeds in and about the old chestnut trees. In the more open parts of the woodland, along the small streams, alders grow in profusion in the grassy, swampy and hummocky soil. Among others, the Canada warbler is a common bird in such situations in mid-July.

The Islands of the Lake. At normal stages of water-level seven islands may be distinguished on the lake expanse. The three largest islands, Frenchman, Dunham and Leete, rise several feet above the water level, while the others vary from one to two feet above this level. In addition, at the two former islands several small rocky shoals which serve as feeding places for herons and other wading birds lie from one to two feet beneath the surface of the water. These islands in particular are interesting in that they afford feeding and breeding places for numerous species of both land and water birds.

Dunham Island. This, the largest of the lake islands (Fig. 175), is a little longer and narrower than Frenchman Island and its surface is somewhat higher above the lake, about twenty feet at its highest point. A narrow bowldery beach rises rather abruptly from the water. Dunham Island lies about a quarter-mile southeast of Frenchman Island, the two being joined by a submerged gravelly and bowldery ridge.

Maples, beeches and ashes form a dense stand on the island, and at least partly on this account the undergrowth is less luxuriant than on Frenchman Island.



Fig. 135. Verona Beach. A congregating place for shore birds. August 13, 1928.



Fig. 136. Verona Beach. Beach pool and aquatic vegetation in foreground. A typical shore bird habitat. August 13, 1928.



Fig. 137. Verona Beach, looking north, east shore of Oneida Lake. Mixed woods along higher part of shore. August 13, 1928.



Fig. 138. Shallow pools at Verona Beach. Feeding grounds of least and semipalmated sandpipers, semipalmated plovers and other shore birds. August 13, 1928.

Frenchman Island. About a mile east of Long Point this triangular body of land, 300 yards long and 200 yards wide at its widest part, rises nearly twenty feet above the surface of the lake. The north, east and west sides present strong, wave-cut terraces but the south side is lower and rises more gradually. The island is widest near the middle and narrows toward either end, its long axis being parallel with the long axis of the lake. A low gravelly beach extends along the south side of the island (Fig. 176); on the northwest side the exposed beach is bowldery; on the northeast side this beach is more or less muddy and forms a wide submerged terrace. Near the west end of the island stands a light-house, some forty or more feet in height, which directs boat traffic through the lake.

A number of years ago the island was partly cleared of smaller vegetation, but much of this has "come back" and a rather dense undergrowth of wild red raspberry, high-bush blackberry and elderberry bushes, ferns and other small plants including five-leaved ivy and an abundance of poison ivy form more or less of a hindrance to human progression. A small area of sumac graces an open place near the center of this island. Goldenrod and Canada thistle also grow in some abundance in open places. Of the trees with which the island is thickly studded, maples, beeches and ashes predominate; a few oaks also are to be found, many of them of good size. Some stately and very fine and symmetrical elms also are growing here.

Toward the close of July the water in the lake becomes lower so that a much greater area of beach is exposed than earlier in the season. On the northeast side of the island an extensive mud flat grown up with sedges, ferns and coarse marsh grass is exposed, while at its southwest extremity an ever-increasing growth of cat-tails, water lilies and sedges occurs. The last named also grow sparsely all along the submerged sandy ridge which unites Frenchman and Dunham islands. Various other plants and shrubs are also found on the island, and the fruit and seeds of some of these together with the insects attending them are attractive to birds.

Of the twenty species of birds found here the bronzed grackle, red-winged blackbird, song sparrow, and starling are the commonest breeding birds. The Maryland yellow-throat, veery, wood pewee and kingfisher also nest on the island and it is visited at frequent intervals by the bald eagle, great blue heron, downy woodpecker, flicker and crow.

Wantry Island. Almost due south of Long Island, about a half-mile from it and lying one and one-half miles south of Constantia, is another small elevation in the lake, Wantry Island (Fig. 170). It is a long, more or less crescent-shaped ridge of bowlders and coarse gravel rising between two and three feet above the normal water level and lying in a northwest-southeast direction. It is about 150 yards long by fifteen yards wide at its widest part which is near the middle, and tapers gradually toward each end. The highest part of the island is a ridge of coarse gravel thrown up all along the east side by the waves (Fig. 174). Small bowlders jut from the water here and there along its shores, particularly toward the extremities of the island (Fig. 173).

The vegetation of the island is confined largely to a few tufts of canary grass (*Phalaris*) (Fig. 172), although the water-pepper (*Polygonum*), a low-growing plant, is evenly though sparsely distributed all along the center of the island. As the season advances this latter type of vegetation becomes more generally distributed and taller, twelve to eighteen inches (August 8), and imparts a greenish tinge to the little island. Mayflies in great numbers rest on the stalks of this plant, and spotted sandpipers often walk through the growth, picking off the insects. Near the south shore of the island a scant growth of sedges appears above the water.

Other than birds there is no evidence of living vertebrate life on the island. However, in mid-July mayflies are abundant, clinging to the vegetation during the day but as night comes on these soft-bodied insects leave their resting places and fly about. On the occasion of my first visit to the island on July 19, 1928, these insects were so numerous that they actually covered me from head to foot, and at times I was forced to hold my hand over my nostrils in order to escape the possibility of inhaling some of the insects. Never before have I observed a species of insect in such enormous numbers. Among the birds that were observed to feed on these insects were least, pectoral and spotted sandpipers. This island is also a favorite feeding place for the great blue heron; as I approached it on August 8, 1929, twelve of these large birds arose from its shores where they had been preening and fishing.

Small islands of this type serve to augment the available supply of desirable nesting, feeding and breeding places for certain types of birds, particularly the shore and wading birds of the lake region.

Dixon Island. This little bowldery island, just southeast of the village of Bernhard Bay on the north side of the lake and about a half-mile off-shore, is often entirely submerged, but in drier seasons the bowlders comprising the island are left high and dry so that they afford a resting place for birds. At the time of my visit to the island on August 2, 1928, the water was from two to three feet deep over it, but its site was marked from shore by the growth of eel-grass which it supported.

Willard Island. West of Dixon Island about three-fourths mile and a good half-mile off-shore in Bernhard Bay is another small bowldery island. The normally exposed part of Willard Island is irregular, from ten to fifteen yards wide at its widest part and twenty to twenty-five yards in length. At the time of my visit to it on August 2, 1928, the dry, exposed bowldery area consisted of less than fifteen square yards. Bunches of tall eel-grass supported myriads of small, delicate-bodied mayflies. On the rocks some excrement of birds indicated that they used the island as a resting place and I observed great blue herons feeding here on several occasions.

The water is very shallow for a little distance around the island and sedges grow in it in some profusion. The entire growth of vegetation here gives a green appearance to the island from the shore and causes it to appear larger than it really is.

Leete Island. Southeast of Shackelton Point and about one-fourth mile off its south shore is Leete Island, the third largest in Oneida Lake. It is about

150 yards long by perhaps thirty at its widest part, which is directed toward the open lake. Its long axis practically parallels that of the lake. Maples and elms make up the most of the larger vegetation on this island. At the west end is a thick growth of water willow. The east and highest portion of the island rises perhaps six to eight feet above normal water level, and a commodious cottage, occupied at intervals during the summer months, is located here.

The island is so close to the mainland and its vegetation is so similar to that thereon that it affords little special encouragement for birds except perhaps in the matter of seclusion.

Long Island. Long Island is a low, bowldery island about 300 yards long by six to ten in width which rises but a foot above normal water level of the lake. It lies in a northwest-southeast direction three-fourths of a mile northeast of Wantry Island and a little over a mile south of the village of Constantia on the north side of the lake. All around the island the water immediately adjacent is shallow, one to two feet in depth. The margins of the island are very rough and broken and there is very little exposed beach.

Canary grass (*Phalaris*) and sedge (*Carex*) are the predominant if not exclusive plant growth on the island, while in the shallow water adjoining, bulrush (*Scirpus*) grows in profusion (Fig. 178). At a little distance this island appears as a long strip of green on the lake surface.

The island affords a rendezvous for great numbers of great blue herons, common terns, spotted and pectoral sandpipers, herring gulls and other aquatic and semi-aquatic birds, some of which also nest here. Black ducks also frequent the island in numbers (August), especially toward the east end which is broken up into numerous islets so that a number of little bayous are formed, the sedges hiding them from the open lake on one side while the canary grass conceals them from the other.

SOME SPECIAL LOCAL ECOLOGICAL CONSIDERATIONS AS REFLECTED IN THE AVIFAUNA OF THE ONEIDA LAKE REGION

Among those who have made a study of the distribution of animals it is generally recognized that the prevalence of bird life in a given region and the relative abundance of the various species which occur are largely dependent upon the surroundings. The inter-relations of the bird with its environment are very complex, for not only do such items as food supply and the availability of nesting materials and nesting sites play a prominent part in its life, but also the kinds and abundance of plants, and other animal life, as well as such physical factors as the presence of streams, ponds, hills and the like, exert a profound influence upon at least the more or less local occurrence of a given species.

While the general physiographic, vegetational and other features of the Oneida Lake region have been set forth in the preceding pages, more than passing interest is associated with the specific manner in which the bird life of this area is governed by and reflected in the various types of local conditions that are offered. It is in an attempt briefly to point out a few outstanding concrete

illustrations of the distribution and occurrence of some of the species of birds of the region in relation to these factors that the following data and accompanying tables are submitted.

Although a little more than sixty species of birds were recorded on several different days of the 1928 season, the greatest number observed and heard on any one day was sixty-nine. The list is of interest for it indicates in some measure the prevalent forms of bird life in the region in late spring, as well as the relative abundance of certain species mentioned. The descriptive data pertaining to this field trip are as follows:

"May 21, 1928, 6:45 A. M., 62° F., cloudy and foggy; cleared in P. M., light wind. By motor from Lower South Bay to Little Bay northeast of Brewerton, thence along lake shore, through willow swamp to Big Bay district and Emmons' woods. Seventeen miles by motor and four to five miles on foot."

The greatest number of forms recorded on any one day during the season of 1929 was seventy-six. This list was obtained on May 17, between seven o'clock in the morning and twelve o'clock noon. While it does not contain as many warblers as the list of May 21, 1928, it does give a somewhat better cross-section of the bird fauna of the region and is more representative of the generally prevailing conditions at this season of the year. Descriptive data pertaining to this field trip are as follows:

"May 17, 1929. 7:00 A. M. Clear, cold; near frost last night. By motor car to Vandercamp woods one and one-half miles northwest of Cleveland, thence to F. C. Soule estate one mile farther north; through estate one mile and return to Cleveland via Bernhard Bay. Nine miles by motor and four miles on foot. Return at noon."

For purposes of comparison the results of these two field trips have been arranged in tabular form. The total list comprises ninety species and the birds observed on the dates mentioned are checked in their respective columns.

TABLE NO. 15.—LIST OF THE SPECIES OF BIRDS OBSERVED IN THE ONEIDA LAKE REGION ON MAY 21, 1928, AND MAY 17, 1929.

Name of Bird	May 21, 1928	May 17, 1929	Remarks
Bittern, American	x	...	1 bird, Little Bay district
Bittern, eastern least	x	...	
Blackbird, eastern red-winged	x	x	
Bluebird, eastern	x	x	
Bobolink	x	x	
Catbird	...	x	
Chickadee, black-capped	x	x	
Cowbird	x	x	
Crow	x	x	
Cuckoo, black-billed	...	x	
Dove, eastern mourning	x	x	
Duck, lesser (?) scaup	...	x	
Flicker, northern	x	x	Several
Flycatcher, northern crested	x	x	Fairly common on 21
Flycatcher, least	x	x	Several
Goldfinch, eastern	x	x	
Grackle, bronzed	x	x	
Grebe, horned	...	x	
Grosbeak, rose-breasted	...	x	
Grouse, eastern ruffed	...	x	
Hawk, Cooper's	...	x	
Hawk, marsh	x	x	Two in Big Bay district on 21
Heron, great blue	x	x	3 birds Little Bay on 21
Heron, eastern green	x	...	Common, Emmons' woods
Hummingbird, ruby-throated	x	x	Male
Jay, northern blue	x	x	
Killdeer	x	x	
Kingbird, eastern	x	x	
Kingfisher, eastern belted	x	x	
Loon, common	...	x	
Martin, purple	x	x	
Meadowlark, eastern	x	x	
Nuthatch, white-breasted	x	x	Several, both dates
Oriole, Baltimore	x	x	
Oven-bird	x	x	Several
Pewee, eastern wood	x	...	Common
Pheasant, ring-necked	...	x	
Phoebe	x	x	
Redstart	x	x	
Robin, eastern	x	x	
Sandpiper, spotted	x	x	Common, lake shore
Sparrow, eastern chipping	...	x	
Sparrow, eastern field	...	x	
Sparrow, eastern Savannah	x	x	
Sparrow, eastern vesper	x	x	
Sparrow, English	x	x	
Sparrow, song	x	x	
Sparrow, swamp	...	x	Common, open fields
Sparrow, white-throated	x	x	
Starling	x	x	Carrying food for young on 21
Swallow, bank	...	x	
Swallow, barn	x	x	
Swallow, northern cliff	...	x	
Swallow, tree	x	x	
Swift, chimney	...	x	
Tanager, scarlet	x	x	2 males, Emmons' woods on 21
Thrasher, brown	...	x	
Thrush, eastern hermit	...	x	
Thrush, gray-cheeked	x	...	

TABLE NO. 15.—(Continued).

Name of Bird	May 21, 1928	May 17, 1929	Remarks
Thrush, olive-backed	x	x	
Thrush, wood .....	...	x	
Towhee, red-eyed .....	...	x	
Veery	x	x	
Vireo, blue-headed .....	...	x	
Vireo, red-eyed	x	x	
Vireo, warbling	x	...	
Vireo, yellow-throated	x	...	
Warbler, bay-breasted	x	...	
Warbler, black and white	x	x	
Warbler, Blackburnian	x	x	Common on May 21
Warbler, black-poll	x	...	
Warbler, black-throated blue	x	x	
Warbler, black-throated green	x	x	
Warbler, Canada	x	x	
Warbler, Cape May	x	...	A pair; Big Bay woods
Warbler, cerulean	x	...	3 birds seen
Warbler, chestnut-sided	x	x	Commonest woodland warbler
Warbler, eastern yellow	x	x	Abundant; not in hardwoods
Warbler, magnolia	x	x	
Warbler, mourning	x	...	Two birds; Little Bay woods
Warbler, myrtle	x	...	
Warbler, Nashville	x	x	
Warbler, northern parula .....	...	x	
Warbler, Tennessee	x	...	Several, Big Bay woods
Water-Thrush, Louisiana	x	x	
Woodpecker, northern downy	x	x	
Woodpecker, eastern hairy	x	x	
Woodpecker, red-headed	x	x	
Wren, eastern house	x	x	
Yellow-throat, northern Maryland	x	x	
Total	69	76	

In connection with the findings of May 21, 1928, at least two items are of special interest. First, the abundance of warblers is particularly notable, twenty species being included in the day's list. So far as this family is concerned the cerulean and mourning warblers are the species of greatest interest. On this date also the unusual abundance of the Blackburnian warbler was of more than passing interest. However, in the wooded tracts the chestnut-sided was the commonest representative of the family.

Although it is not indicated in the table, the second point worthy of mention is the green heron rookery comprising several nests in the elm, ash and ironwood saplings in Emmons' woods. All the nests contained eggs.

Not only will the results of a one-hour bird survey taken on May 23, 1928, along the lake shore at Lower South Bay, illustrate the prevalence of certain species frequenting that type of habitat, but also, when contrasted with a similar survey made on the same date in the Van Antwerp woods (described previously) a half-mile away and occupying the same length of time, it will afford a basis for comparison of the local distribution of species within a small area on the south side of Oneida Lake.

The following table indicates the findings of the two surveys and although they could be considerably augmented under more favorable conditions, they will serve the intended purpose. It will be noted that while a total of thirty-nine species is reported, only eight of the species were observed in both types of habitat.

TABLE NO. 16.—SPECIES OBSERVED ALONG LAKE SHORE AT LOWER SOUTH BAY AND IN NEAR BY MAPLE-HEMLOCK-BEECH WOODS, MAY 23, 1928.

Name of Bird	Lake Shore	Wood-land
Blackbird, eastern red-winged.....	x	x
Bobolink.....	x	..
Cowbird.....	x	x
Crow, eastern.....	x	x
Flicker, northern.....	..	x
Flycatcher, northern crested.....	..	x
Goldfinch, eastern.....	x	x
Grackle, bronzed.....	x	x
Hummingbird, ruby-throated.....	..	x
Jay, northern blue.....	..	x
Kingbird, eastern.....	x	..
Meadowlark, eastern.....	x	..
Nuthatch, white-breasted.....	..	x
Oriole, Baltimore.....	x	x
Oven-bird.....	..	x
Pheasant, ring-necked.....	..	x
Phoebe.....	x	..
Redstart.....	..	x
Robin, eastern.....	x	..
Sparrow, eastern chipping.....	x	..
Sparrow, English.....	x	..
Sparrow, song.....	x	x
Starling.....	x	..
Swallow, barn.....	x	..
Swallow, tree.....	x	..
Thrush, olive-backed.....	..	x
Vireo, red-eyed.....	..	x
Vireo, warbling.....	x	..
Vireo, yellow-throated.....	x	x
Warbler, black-throated blue.....	..	x
Warbler, black-throated green.....	..	x
Warbler, chestnut-sided.....	..	x
Warbler, eastern yellow.....	x	..
Warbler, magnolia.....	..	x
Warbler, myrtle.....	..	x
Woodpecker, northern downy.....	..	x
Woodpecker, eastern hairy.....	..	x
Wren, eastern house.....	x	..
Yellow-throat, northern Maryland.....	x	..
Total.....	22	25

Still another illustration of variance of local distribution within a circumscribed area in the Oneida Lake region is exhibited by the results obtained from a bird survey conducted on two near by but quite different types of tract in the vicinity of the West Monroe Cemetery on the north side of Oneida Lake on May 8, 1928.

A half-mile south of this well-kept cemetery is a small wooded tract with maple, birch and beech predominating; some hemlocks also grow among these trees. Clearings have been made along the edge of the woods and here a considerable thicket of high-bush blackberry, red raspberry, and seedlings of maple occurs. Piles of brush, too, have been heaped up at irregular intervals. One side of the wooded tract extends through a grassy, hummocky bog, but most of it lies on fairly high ground with open rolling meadows largely surrounding it.

To the northwest of the cemetery, a half-mile, is an open hemlock bog surrounded largely by open grassy fields, with some cultivated land near by. The two tracts under consideration are, therefore, about one mile from each other. Approximately ninety minutes were spent at each of these places and the results obtained are herein indicated in tabular form. The complete list of species observed in each place is given.

TABLE NO. 17.—SPECIES OBSERVED IN WOODED TRACT AND HEMLOCK BOG,
NEAR WEST MONROE CEMETERY, MAY 8, 1928.

Name of Bird	Wooded Tract	Hem- lock Bog
Bluebird, eastern.....	x	x
Chickadee, black-capped.....	x	...
Cowbird.....	x	x
Crow, eastern.....	x	x
Dove, eastern mourning.....	...	x
Flicker, northern.....	...	x
Goldfinch, eastern.....	...	x
Hawk, marsh.....	...	x
Hawk, northern red-shouldered.....	...	x
Heron, great blue.....	...	x
Kingbird, eastern.....	...	x
Kingfisher, eastern belted.....	...	x
Meadowlark, eastern.....	...	x
Oven-bird.....	x	...
Phoebe.....	...	x
Redstart.....	x	...
Robin, eastern.....	x	x
Sparrow, eastern chipping.....	x	x
Sparrow, eastern vesper.....	...	x
Sparrow, English.....	...	x
Sparrow, song.....	x	x
Sparrow, white-crowned.....	...	x
Sparrow, white-throated.....	x	...
Starling.....	...	x
Swallow, bank.....	...	x
Swallow, barn.....	...	x
Thrush, eastern hermit.....	x	...
Thrush, gray-cheeked.....	x	...
Thrush, olive-backed.....	x	...
Towhee, red-eyed.....	x	...
Warbler, eastern yellow.....	x	...
Woodpecker, eastern downy.....	x	...
Total.....	16	22



Fig. 139. Tall white pines at Verona Beach. Lookouts for eastern crows.
August 13, 1928.



Fig. 140. Fern hummocks in shallow pool. McClanathan woods, three-fourths
mile northeast of Sylvan Beach. July 11, 1929.



Fig. 141. Barge Canal and breakwater at Sylvan Beach. A favorite gathering place for gulls, terns and shore birds. August 13, 1928.



Fig. 142. Stone breakwater at entrance to Barge Canal, Sylvan Beach. August 13, 1928.

A comparison of the relative abundance of the commoner species of birds which occur on the north side of Oneida Lake during the latter half of July, with those occurring on the south side at the same season is of interest and reflects, in some measure, the prevailing conditions in the two districts bordering this body of water. The following table includes thirty-three species of marsh and land birds in which a *marked* difference in their relative abundance occurs on the two sides of the lake.

TABLE NO. 18.—SHOWING RELATIVE ABUNDANCE OF BIRDS ON THE NORTH AND SOUTH SIDES OF ONEIDA LAKE.

Species of Birds Markedly More Abundant on North Side of Oneida Lake	Species of Birds Markedly More Abundant on South Side of Oneida Lake
Eagle, southern bald Flicker, northern Heron, great blue Jay, northern blue Redstart Sparrow, eastern field Swallow, northern cliff Swift, chimney Tanager, scarlet Thrasher, brown Towhee, red-eyed Warbler, black and white Warbler, Blackburnian Warbler, black-throated blue Warbler, black-throated green Whip-poor-will, eastern Woodpecker, red-headed	Blackbird, eastern red-winged Bobolink Dove, eastern mourning Gallinule, Florida Martin, purple Pheasant, ring-necked Rail, Virginia Robin, eastern (?) Sparrow, eastern Savannah Sparrow, song Sparrow, swamp Swallow, tree Warbler, eastern yellow Wren, long-billed marsh Yellow-throat, northern Maryland

On the north side of the lake a greater amount of continuous woodland and wooded, or partly wooded, boggy land occurs than on the south side, although here isolated patches occur, and more extensive open marshes and swamps are met with. These conditions account, in large measure, for the rather surprising degree of variation in local abundance of the species mentioned.

Of course some differences in local distribution and abundance may be noted among other species and, no doubt, these as well as the ones mentioned fluctuate to some extent in these regards from year to year. In other cases it is very difficult to determine whether a bird, perhaps rare, perhaps common is, as a species, more representative of one side of the lake than of the other. Nevertheless, the fact remains that here, within a distance of six miles, where rather marked topographic and vegetational conditions occur on either side of a body of water twenty-one miles long and five and one-half miles wide, certain rather well-marked differences in the avifauna likewise are exhibited and furnish an ecological situation of local interest at least.

As might be expected, also, the bird faunas of the islands in Oneida Lake possess their similarities and dissimilarities. The results of a brief survey of Frenchman and Dunham islands on May 26, 1928, are of interest in this connection. About seventy minutes were spent at each island, during which time a

total of twenty-five species was observed; seventeen species were seen at Frenchman and the same number at Dunham.

The most significant item concerning the findings is the way in which the type of bird life is reflected by the type of plant growth. Frenchman Island—lower, more swampy, less heavily wooded—supports in general a group of birds illustrating such conditions of terrain and vegetation. Dunham Island—higher, drier, more heavily wooded and only one-fourth mile from it—supports a rather different assemblage of bird life. The following table will illustrate these features.

TABLE NO. 19.—LIST OF BIRDS OBSERVED ON MAY 26, 1928, ON AND IN THE IMMEDIATE VICINITY OF FRENCHMAN AND DUNHAM ISLANDS.

Name of Bird	Frenchman Island	Dunham Island	Remarks
Blackbird, eastern red-winged	*x	x	Commonest bird on Frenchman; preparing to nest
Crow, eastern	*x	.....	1 or 2 flying over
Duck, common black	*x	.....	1 pair off shore
Flicker, northern	*x	x	
Flycatcher, northern crested .....	.....	x	
Goldfinch, eastern	x	x	Common
Grackle, bronzed	*x	.....	Mating
Heron, great blue .....	.....	x	
Kingfisher, eastern belted	*x	x	
Loon, common .....	.....	x	1 pair off shore
Oriole, Baltimore	x	.....
Pewee, eastern wood	*x	x	
Redstart .....	.....	x	
Robin, eastern	x	.....
Sandpiper, spotted	*x	x	Second in point of abundance on Frenchman; commoner there than at Dunham
Sparrow, song	*x	x	Ranks third in abundance at Frenchman
Starling	x	x	Common on Frenchman
Swallow, tree	x	x	
Veery	*x	.....
Vireo, red-eyed .....	.....	x	
Warbler, black-throated blue .....	.....	x	
Warbler, chestnut-sided	x	.....
Warbler, magnolia .....	.....	x	
Wren, eastern house .....	.....	x	
Yellow-throat, northern Maryland	*x	.....	Several

*Observed also on July 24, 1928

Long and Wantry islands, similar in themselves but quite unlike Frenchman and Dunham islands, appeal for the most part to a different group of birds. The limited expanse of the islands, their low bowldery shores, and vegetation mostly of water pepper and long grass, offers a favorite retreat for numbers of shore and water birds, but some of the more aerial "land birds" also find attractions there.

The following list is a composite one made up of all species of birds which I have observed on or in the immediate vicinity of Long and Wantray islands in the course of my several visits to these places during my two seasons of field work.

TABLE NO. 20.—A COMPOSITE BUT COMPLETE LIST OF THE BIRDS OBSERVED ON AND IN THE IMMEDIATE VICINITY OF LONG AND WANTRAY ISLANDS.

Name of Bird	Long Island	Wantray Island	Remarks
Blackbird, eastern red-winged.....	x	x	
Duck, common black.....	x	.....	Also off both islands
Duck, lesser (?) scaup.....	.....	x	Off shore
Eagle, southern bald.....	.....	x	
Grebe, horned.....	x	.....	Off shore
Gull, Bonaparte's.....	x	.....
Gull, herring.....	x	.....
Gull, ring-billed.....	x	.....
Heron, Black-crowned night.....	x	.....	Remains of dead bird
Heron, great blue.....	x	x	
Killdeer.....	x	x	
Kingfisher, eastern belted.....	.....	x	Flying over
Martin, purple.....	.....	x	
Merganser, red-breasted.....	x	.....
Plover, semipalmated.....	x	x	
Sanderling.....	x	x	
Sandpiper, eastern solitary.....	x	x	
Sandpiper, least.....	x	x	
Sandpiper, pectoral.....	x	x	
Sandpiper, semipalmated.....	x	x	
Sandpiper, spotted.....	x	x	
Swallow, bank.....	x	.....	(Flying over island
Swallow, barn.....	.....	x	Feeding on insects on
Swallow, tree.....	.....	x	grass
Tern, black.....	x	x	Courising about islands
Tern, common.....	x	x	
Yellow-legs, greater.....	.....	x	
Yellow-legs, lesser.....	x	x	
Total.....	21	20	

A brief consideration of the territory about Oneida Lake is sufficient to indicate that a host of excellent opportunities is offered for preserving and maintaining natural or near natural conditions so far as both plants and animals are concerned. The Sylvan Beach, Constantia, Cleveland, Cicero Swamp, and possibly other districts are some that might reasonably be selected. It would seem that the proper State agencies should not overlook the possibility of acquiring and setting aside certain tracts as permanent refuges and preserves for wild mammals, birds, trees and flowers.

That at least some of the residents in the vicinity of Oneida Lake are interested in such matters is indicated by the query which a certain well-to-do farmer put to me one June day when he said, "When is the State going to make that place (Hitchcock Point district) a game preserve?" It might be added that this territory would make a highly desirable acquisition for such a purpose for birds of many species frequent it and breed there. This was one of my

very best field stations and many an enjoyable and profitable hour was spent there in observation.

While it is now too late to take measures for preserving much of the original woodland in the region, some limited tracts still remain and these might well be maintained intact for all time. In addition, certain other second growth tracts which have been undisturbed for a period of years might be permitted to continue unmolested. Reforestation of many of them might be undertaken with profit. As a result, a number of small-scale representations of primitive conditions might be set up which would, in the long run, be of value from the standpoint of encouraging and maintaining the presence and well-being of a considerable amount of wild animal life. In addition, such an undertaking would offer to the people of the State a series of recreational parks where nature might be viewed at first hand and without restriction. Action should be taken soon for the situation is not likely to improve with time. The purchase of these properties by the State and the enactment of suitable legislation looking toward their proper protection could properly and profitably be undertaken now. Indeed, most of the Oneida Lake region itself might well be made the heart of a vast development for the enjoyment and well-being of the people as well as a reserve for the protection and preservation of the wild animal and plant life which now flourishes in the territory, together with any other desirable kinds that might find a sanctuary therein.

TABULAR LIST OF THE LATE SPRING AND SUMMER BIRDS OBSERVED IN THE ONEIDA LAKE REGION

In the preparation of this table, our findings of the 1928 season have been employed as the basis for the enumeration of species which are here listed in alphabetical order. With the beginning of the 1929 season, the principal forms occurring in the region having been ascertained, the relative frequency of their occurrence became one of the primary factors for consideration. Accordingly a complete list of the species observed on each field trip was kept and the results obtained are indicated in the table.

Of course field excursions were made on different days to various types of habitat, so that on one date, e.g., marsh birds might predominate; another day might be given over mainly to observations in deciduous or mixed woods, when somewhat different results were obtained; while an all-water trip to Long and Wantry islands yielded a smaller list and one comprising mainly aquatic or semi-aquatic species. However, on the whole, the list taken as an entity, affords a fairly representative cross-section of the bird fauna of the region within the time limits covered by it, and presents at least some notion of the comparative frequency with which the species mentioned are likely to be seen. It offers, as well, a reasonably complete enumeration of the summer birds which occur in the Oneida Lake region.

It is interesting to note that of the 157 species observed in the season of 1928, all but fourteen were recorded in the 1929 season, while during the latter period thirteen additional forms were listed. The complete inventory for the two seasons, therefore, totals 170 forms. The greatest number of species recorded for any one day was 76, on May 17, 1929.

TABLE NO. 21.—ALPHABETICAL LIST OF BIRDS OBSERVED IN THE ONEIDA LAKE REGION DURING MAY, 1928.

Name of Bird	Day of Month																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Bittern, American.....	x	x																														
Bittern, eastern least.....																																
Blackbird, eastern red-winged.....																																
Bluebird, eastern.....	x	x																														
Bobolink.....		x	x																													
Bunting, indigo.....																																
Catbird.....																																
Chickadee, black-capped.....																																
Coot, American.....	x	x																														
Cowbird.....	x	x																														
Creep, brown.....																																
Crow, eastern.....	x	x																														
Cuckoo, black-billed.....																																
Dove, eastern mourning.....																																
Duck, common black.....																																
Duck, lesser (?) scap.....																																
Duck, wood.....	x	x																														
Eagle, southern bald.....	x																															
Finch, purple.....																																
Flicker, northern.....	x	x																														
Flycatcher, alder.....																																
Flycatcher, least.....																																
Flycatcher, northern crested.....																																
Flycatcher, yellow-bellied.....																																
Gallinule, Florida.....																																
Golden-eye, American.....	x																															
Goldfinch, eastern.....																																
Goose, Canada.....	x																															
Grackle, bronzed.....	x	x																														
Grebe, horned.....	x																															
Grebe, pied-billed.....																																
Grosbeak, eastern evening.....																																
Grosbeak, rose-breasted.....																																
Grouse, eastern ruffed.....																																
Gull, Bonaparte's.....																																
Gull, herring.....																																

Observed on two occasions in May, but exact dates are lacking.

TABLE No. 21.—MAY, 1928—(Continued).

[illegible]

TABLE No. 22.—JUNE, 1928—(Continued).

Name of Bird		Day of Month																												
1	3	4	5	6	7	8	10	11	12	13	14	15	17	18	19	21	22	24	25	26	27	29								
Tern, black.....																														
Tern, common.....														x																
Thrasher, brown.....	x	x																												
Thrush, eastern hermit.....	x	x	x																											
Thrush gray-cheeked.....																														
Thrush, olive-backed.....	x																													
Thrush, wood.....	x	x																												
Towhee, red-eyed.....	x	x	x	x	x	x	x	x																						
Veery.....	x	x	x	x	x	x	x	x																						
Vireo, blue-headed.....																														
Vireo, red-eyed.....	x	x	x	x	x	x	x	x																						
Vireo, warbling.....	x	x	x	x	x	x	x	x																						
Vireo, yellow-throated.....	x	x	x	x	x	x	x	x																						
Warbler, bay-breasted.....	x																													
Warbler, Blackburnian.....	x	x																												
Warbler, black and white.....	x	x																												
Warbler, black-poll.....	x	x																												
Warbler, black-throated blue.....	x	x	x	x	x	x	x	x																						
Warbler, black-throated green.....	x	x	x	x	x	x	x	x																						
Warbler, Canada.....	x	x	x	x	x	x	x	x																						
Warbler, Cape May.....																														
Warbler, cerulean.....																														
Warbler, chestnut-sided.....	x	x	x	x	x	x	x	x																						
Warbler, eastern yellow.....	x	x	x	x	x	x	x	x																						
Warbler, golden-winged.....																														
Warbler, magnolia.....	x	x	x	x	x	x	x	x																						
Warbler, mourning.....																														
Warbler, myrtle.....																														
Warbler, Nashville.....	x	x	x	x																										
Warbler, northern parula.....																														
Warbler, western palm.....																														
Warbler, prothonotary.....																														
Warbler, Tennessee.....		x		x																										
Warbler, Wilson's.....																														
Warbler, yellow palm.....																														
Water-Thrush, Louisiana.....	x			x		x	x	x																						

TABLE No. 22.—JUNE, 1928—(Continued).

Name of Bird	Day of Month																							
	1	3	4	5	6	7	8	10	11	12	13	14	15	17	18	19	21	22	24	25	26	27	29	
Water-Thrush, northern.....																								
Waxwing, cedar.....	x	x	x	x	x	x	x	x	x	x				x			x			x	x			
Whip-poor-will, eastern.....							x																	
Woodcock, American.....																								
Woodpecker, northern downy.....			x							x														
Woodpecker, eastern hairy.....	x	x	x		x																			
Woodpecker, red-headed.....	x	x	x		x					x														
Wren, eastern house.....	x	x	x		x																			
Wren, eastern winter.....																								
Wren, long-billed marsh.....																								
Yellow-legs, greater.....																								
Yellow-legs, lesser.....																								
Yellow-throat, northern Maryland	x	x	x		x		x	x	x	x	x	x	x	x			x			x	x	x		
Additions Made to the 1928 List During the Season of 1929																								
Baldpate.....																								
Buffle-head.....																								
Crossbill, red.....																								
Duck, ruddy.....																								
Egret, American.....																								
Osprey.....																								
Owl, saw-whet.....																								
Pipit.....																								
Siskin, northern pine.....																								
Sora.....												x				x								
Turnstone ruddy.....																								
Warbler, hooded.....		x			x																			
Wren, short-billed marsh.....																				x				
Total No. Species for Day.....	59	66	64	54	58	56	67	59	58	42	50	51	39	42	55	9	43	41	50	57	46	48	32	
Total No. Species for Season.....	135	136	136	136	136	136	136	136	137	138	139	140	141	141	143	144	144	145	145	146	146	146	146	

TABLE No. 23.—JULY, 1928—(Continued).

[illegible]

TABLE No. 23.—JULY, 1928—(Continued).

Name of Bird	Day of Month														Additions Made to the 1928 List During the Season of 1929					
	2	3	5	6	8	9	11	12	15	17	18	19	20	22	23	24	26	27	29	30
Water-Thrush, northern.....									x											
Waxwing, cedar.....	x	x	x	x		x		x	x	x			x				x		x	x
Whip-poor-will, eastern.....																				
Woodcock, American.....																				
Woodpecker, northern downy.....		x						x	x	x			x							
Woodpecker, eastern hairy.....																				
Woodpecker, red-headed.....																				
Wren, eastern house.....																				
Wren, eastern winter.....																				
Wren, long-billed marsh.....																				
Yellow-legs, greater.....	x																			
Yellow-legs, lesser.....																				
Yellow-throat, northern Maryland.....	x	x	x	x	x															
Baldpate.....																				
Buffle-head.....																				
Crossbill, red.....																				
Duck, ruddy.....																				
Egret, American.....																				
Osprey.....																				
Owl, saw-whet.....																				
Pipit.....		x																		
Siskin, northern pine.....																				
Sora.....																				
Turnstone, ruddy.....																				
Warbler, hooded.....																				
Wren, short-billed, marsh.....			x																	
Total No. Species for Day.....	47	46	52	28	49	9	53	42	62	48	48	46	55	56	52	60	42	55	52	66
Total No. Species for Season.....	147	148	148	148	148	150	150	150	152	152	152	152	152	153	153	153	153	153	153	153

TABLE NO. 24.—ALPHABETICAL LIST OF BIRDS OBSERVED IN THE ONEIDA LAKE REGION DURING AUGUST, 1928.

Name of Bird	Day of Month						
	1	2	6	7	9	12	13
Bittern, American.....				X		X	
Bittern, eastern least.....				X			
Blackbird, eastern red-winged.....	X	X	X	X	X	X	
Bluebird, eastern.....	X		X	X		X	
Bobolink.....	X			X	X	X	
Bunting, indigo.....	X						
Catbird.....	X		X	X	X		
Chickadee, black-capped.....	X			X	X		
Coot, American.....							
Cowbird.....			X	X			
Creeper, brown.....							
Crow, eastern.....	X		X	X	X	X	
Cuckoo, black-billed.....				X			
Dove, eastern mourning.....			X	X			
Duck, common black.....		X		X		X	X
Duck, lesser (?) scaup.....							
Duck, wood.....							
Eagle, southern bald.....	X	X				X	
Finch, purple.....							
Flicker, northern.....	X		X	X		X	
Flycatcher, alder.....							
Flycatcher, least.....							
Flycatcher, northern crested.....					X	X	
Flycatcher, yellow-bellied.....							
Gallinule, Florida.....				X			
Golden-eye, American.....							
Goldfinch, eastern.....	X		X	X	X	X	
Goose, Canada.....							
Grackle, bronzed.....	X		X	X	X	X	
Grebe, horned.....							
Grebe, pied-billed.....							
Grosbeak, eastern evening.....							
Grosbeak, rose-breasted.....							
Grouse, eastern ruffed.....							
Gull, Bonaparte's.....							X
Gull, herring.....			X		X	X	X
Gull, ring-billed.....			X		X	X	X
Hawk, broad-winged.....							
Hawk, Cooper's.....				X			
Hawk, northern red-shouldered.....	X						
Hawk, eastern red-tailed.....							
Hawk, eastern sparrow.....							
Hawk, marsh.....			X	X			
Hawk, sharp-shinned.....							
Heron, black-crowned night.....				X		X	
Heron, eastern green.....			X	X	X	X	
Heron, great blue.....	X	X	X	X	X	X	X
Hummingbird, ruby-throated.....	X					X	
Jay, northern blue.....	X						
Junco, slate-colored.....							
Killdeer.....	X	X	X	X	X	X	X
Kingbird, eastern.....	X	X		X	X	X	
Kingfisher, eastern belted.....	X		X		X	X	X
Kinglet, eastern ruby-crowned.....							
Lark, prairie horned.....							
Loon, common.....							
Martin, purple.....	X		X		X	X	
Meadowlark, eastern.....	X		X	X	X	X	
Merganser, American.....							

TABLE NO. 24.—AUGUST, 1928—(Continued).

Name of Bird	Day of Month						
	1	2	6	7	9	12	13
Merganser, hooded							
Merganser, red-breasted							
Mockingbird, eastern							
Nighthawk, eastern				X			
Nuthatch, red-breasted							
Nuthatch, white-breasted			X		X	X	
Oriole, Baltimore						X	
Oven bird	X						
Owl, great-horned							
Owl, eastern screech							
Pewee, eastern wood	X		X	X	X	X	
Pheasant, ring-necked						X	
Phoebe	X			X	X	X	
Plover, semipalmated		X	X		X	X	X
Plover, upland						X	
Rail, Virginia				X			
Redstart							
Robin, eastern	X		X	X	X	X	
Sanderling		X	X				
Sandpiper, eastern solitary		X					
Sandpiper, least		X	X		X	X	X
Sandpiper, pectoral			X				X
Sandpiper, semipalmated		X	X		X	X	X
Sandpiper spotted	X	X	X		X	X	X
Sapsucker, yellow-bellied							
Shrike, migrant							
Snipe, Wilson's				X			
Sparrow, eastern chipping	X		X		Seldom seen late July and August		
Sparrow, eastern field	X						
Sparrow, eastern fox							
Sparrow, eastern grasshopper							
Sparrow, eastern Henslow's							
Sparrow, eastern Savannah	X			X		X	
Sparrow, eastern tree							
Sparrow, eastern vesper	X						
Sparrow, English	X		X		X	X	
Sparrow, song	X		X	X	X	X	
Sparrow, swamp	X			X			
Sparrow, white-crowned							
Sparrow, white-throated							
Starling	X		X	X	X	X	
Swallow, bank		X	X		X	X	
Swallow, barn	X	X	X	X	X	X	
Swallow, northern cliff	X		X	X	X	X	
Swallow, rough-winged							
Swallow, tree	X	X	X	X	X	X	
Swift, chimney			X		X		
Tanager, scarlet							
Teal, blue-winged							X
Tern, black							
Tern, common		X					X
Thrasher, brown							
Thrush, eastern hermit							
Thrush, gray-cheeked							
Thrush, olive-backed							
Thrush, wood							
Towhee, red-eyed	X		X				
Veery	X			X			
Vireo, blue-headed							
Vireo, red-eyed	X		X	X		X	

TABLE No. 24.—AUGUST, 1928—(Continued).

Name of Bird	Day of Month						
	1	2	6	7	9	12	13
Vireo, warbling.....	X						
Vireo, yellow-throated.....	X						
Warbler, bay-breasted.....							
Warbler, Blackburnian.....							
Warbler, black and white.....							
Warbler, black-poll.....							
Warbler, black-throated blue.....							
Warbler, black-throated green.....							
Warbler, Canada.....			X		X		
Warbler, Cape May.....							
Warbler, cerulean.....							
Warbler, chestnut-sided.....			X				
Warbler, eastern yellow.....			X		X	X	
Warbler, golden-winged.....							
Warbler, magnolia.....							
Warbler, mourning.....							
Warbler, myrtle.....							
Warbler, Nashville.....			X				
Warbler northern parula.....							
Warbler, western palm.....							
Warbler, prothonotary.....							
Warbler, Tennessee.....							
Warbler, Wilson's.....							
Warbler, yellow palm.....							
Water-Thrush, Louisiana.....							
Water-Thrush, northern.....			X				
Waxwing, cedar.....	X		X	X	X	X	
Whip-poor-will, eastern.....							
Woodcock, American.....							
Woodpecker, northern downy.....	X				X	X	
Woodpecker, eastern hairy.....							
Woodpecker, red-headed.....	X		X				
Wren, eastern house.....	X						
Wren, eastern winter.....							
Wren, long-billed marsh.....				X			
Yellow-legs, greater.....							X
Yellow-legs, lesser.....		X			X	X	X
Yellow-throat, northern Maryland.....	X			X		X	

Additions Made to the 1928 List During the Season of 1929

Baldpate.....							
Buffle-head.....							
Crossbill, red.....							
Duck, ruddy.....							
Egret, American.....						X	
Osprey.....						X	
Owl, saw-whet.....							
Pipit.....							
Siskin, northern pine.....							
Sora.....							
Turnstone, ruddy.....			X				
Warbler, hooded.....							
Wren, short-billed marsh.....						X	
Total No. Species for Day.....	46	17	46	42	38	50	16
Total No. Species for Season.....	153	153	154	154	154	155	155

ANNOTATED LIST OF LATE SPRING AND SUMMER BIRDS
OBSERVED IN THE ONEIDA LAKE REGION

ORDER GAVIIFORMES

LOONS: FAMILY GAVIIDAE

Common Loon. *Gavia immer immer* (Brünnich).

This large and conspicuous diver is a fairly common transient visitant on Oneida Lake. My records for its occurrence there extend from May 1 to June 6. At no time have I seen more than two birds together. The species may occur on any part of the lake but is more likely to be seen in protected bays and coves, where it may feed in comparative quiet and without the distractions incident to the open and rougher waters. Lower South Bay, Brewerton, Delmarter Bay, Maple Bay and Bernhard Bay are the places in which I have seen it most frequently. On May 25, 1928, I saw a pair feeding off the southwest point of Dunham Island. Usually the birds keep seventy-five or more yards off shore but they will permit extended observation at this distance without any show of anxiety for their safety. Between May 17 and June 6, 1929, I saw, on several occasions, a bird in either immature or winter plumage at Bernhard Bay. It remained in this district for several days.

The common loon occurs as a transient visitant on all the larger bodies of water in New York, and formerly bred on some of them. It is said to breed now on a few isolated ponds and lakes in the Adirondacks, and not infrequently also winters in the warmer portions of the State. It is likely to be seen in the Oneida Lake region in early April, but by June 1 most of the birds have passed on north. Belated individuals, such, perhaps, as my Bernhard Bay example, may be seen as late as the third week in June. The first birds return from the north about mid-September and the movement continues through November.

With the exception of Oneida Lake it is not likely that the loon would be found on any of the other ponds or lakes of the immediate territory unless Panther Lake or Kibby Lake should meet its requirements, for it commonly frequents only larger bodies of water; it is a wary bird and the open expanses of water permit it to exercise its unusual powers of diving if danger threatens. It can remain submerged for long periods of time and if pursued in a boat it will frequently swim under water for a considerable distance, appearing above the surface after perhaps two or three minutes though at some quite unsuspected point. I often have been the victim of this exasperating habit on the part of the bird. On land, however, the loon is exceedingly awkward, for its short legs, placed well toward the posterior end of the body, permit only of a slow, waddling gait which is accompanied by much flapping of the wings and aided by the use of the long bill. The bird is a strong flier.

The loud, shrill, penetrating cry of this bird is often uttered at night and produces a weird, hair-raising effect on the not-too-distant listener; although I have often heard it I still am subject to the reaction mentioned. The note may be written thus: "o-o-oo-h." The so-called *laugh* of the loon, "hoo, hoo, hoo, hoo,

hoo," uttered rapidly, is in my experience more frequently heard, and while it possesses a rather mournful and melancholy tone it does not give the depressing effect that characterizes the cry. I have heard this note at Oneida Lake in May.

The eggs, two in number, are deposited in a nest close to the water's edge. Deposition occurs in late May or early June. The young are extremely precocial. Fishes form the principal item of diet of this bird and capture is effected by pursuit under water.

ORDER COLYMBIFORMES

GREBES: FAMILY COLYMBIDAE

Horned Grebe. *Colymbus auritus* Linnaeus.

During the first half of May our notes contain numerous records of the occurrence of this fine diver on the waters of Oneida Lake. It seems to exhibit no particular preference for any locality, but I have found it more commonly on the south side of the lake, from Brewerton to Shackelton Point, and in the vicinity of Constantia Bay. My latest dates are May 17, 1929, when one bird was seen on the lake just off-shore at the village of Bernhard Bay, and June 19, 1929, when, in early evening, I saw a pair in the water on the south side of Long Island. The occurrence of these birds here at this season suggests the likelihood that the species breeds in the vicinity. From May 1 to 10 seems to be the period of greatest abundance of the horned grebe in the region, and at that season a pair or two, or perhaps a small flock of a half-dozen birds, can be seen feeding off-shore anywhere along the south side of the lake, where protection from the cold west winds is afforded, as well as in sheltered bays along the north side of the lake. These birds seem to prefer open waters rather than the reedy shallows so often chosen by the pied-billed grebe.

That the numbers of the horned grebe fluctuate considerably from year to year here cannot be doubted, for, during the 1929 season, I saw it much oftener and in considerably greater numbers than during the 1928 season. The vicinity of Maple Bay seemed to offer something particularly attractive to these birds, for I could always be sure of finding at least a pair or two feeding off shore here in both seasons. On May 8, 1929, the species was especially abundant in this and adjoining districts and I saw more of the birds on the morning of that day than at any other time during my residence at the lake.

The horned grebe arrives from the south during the latter part of March and passes on northward about mid-May. During migration it occurs both singly and in small flocks. It appears to be common on the larger bodies of water in the State as well as on adjoining salt water. It has been recorded as a summer resident in the Lake Ontario region, and it remains in winter as long as the lakes and streams are open, but by mid-November practically all except a few along the coast have moved farther south.

If not pressed too closely this grebe will swim rapidly away, exhibiting at the same time a jerking movement of the head similar to that of the coot. However, if frightened or followed persistently at close quarters it will usually give an excellent exhibition of diving. Sometimes it will swim along with the body almost or entirely submerged, only the head, bent at a right angle to the rather

long neck, being visible above the water. I have often watched the birds perform in this manner, alternately swimming and diving until well out of the zone of fancied danger. On account of its diving ability this bird shares with a number of others such appellations as hell-diver, water-witch, dipper and pink-eyed diver. Eaton (1910, p. 95) says, "I have often seen it remain under water for three minutes and cover a distance of at least thirty rods at one dive"; and I believe that my own observations on the bird will bear out his statement.

In its nuptial plumage, the one in which it is commonly seen here in the spring, this grebe presents a striking appearance with its greenish black crown, chin and ruff, its chestnut lores and the erectile buffy plumes behind the eyes. A conspicuous white patch on the wings marks the position of the secondaries.

Pied-billed Grebe. *Podilymbus podiceps podiceps* (Linnaeus).

The pied-billed grebe, commonly known as the hell-diver, is apparently an uncommon and a very locally distributed summer resident in the Oneida Lake region. Although it probably occurs more frequently in this territory in both spring and fall, I saw it here in less than a half-dozen places during our two seasons of field work.

In New York State this grebe is present mostly as a migrant although it may winter in the warmer parts of the Commonwealth. It ranges over most of North and South America and breeds as far north as Canada. Spring arrivals in the Oneida Lake region may be expected early in April and most have passed on north by early May, to return again in late August or early September and to pass on south in October. A few remain in this territory to breed, and I should not be surprised to find an occasional bird about the open waters of Oneida Lake, in the vicinity of springs, even in mid-winter.

The summer habitat of the pied-billed grebe is a pond or lake or sluggish stream bordered by cat-tails, flags and eel-grass. In such situations it feeds and breeds. Except during migration it is seldom found in the open and deeper waters which the horned grebe is so wont to frequent. The nearest approach to such a situation locally is at the outlet of Oneida Lake at Brewerton, where I have seen the bird a few times during our investigations.

This bird is shy and secretive and usually chooses the protection and seclusion of shallow-water vegetation. Not until July 16 of the 1928 season did I record a pied-billed grebe in the territory. Although I had been on the lookout for the species and had indicated in my notes that I thought it should occur here, I had not found it. On that date, at the Lower South Bay trolley station, in a little lagoon formed by a peninsula extending out into Oneida Lake and serving as a kind of breakwater, I saw a single bird, feeding and quite undisturbed by the frequently passing automobiles on the State road 100 feet away and about twenty feet above the lake level (Fig. 177).

The shore here is high and supports a rich growth of vegetation with willow and dogwood predominating. Near the water, sedges and cat-tails are abundant, while blue flags and yellow water lilies grow in the quiet shallow waters of the bayou where the grebe was feeding. The bird was busily engaged in diving for food and at intervals—some of them of long duration—it came to the surface

and swam slowly to another part of the lagoon, accompanying its swimming efforts with a peculiar jerking movement of the neck. At times it gave vent to a loud, sonorous "cow-cow-cow-cowugh-cowugh" with the number of "cows," "cowughs," varying from time to time. The notes remind one somewhat of those of the Florida gallinule and to some extent, also, of the laughing call of the loon, although of course not so loud or resonant as the call of the latter but nevertheless possessing some of its qualities.

Several times afterward a grebe was seen at this point and it is not improbable that it was the same bird on each occasion.

On June 15, 1929, at the same place, I discovered an adult bird accompanied by at least three small downy young with distinctly streaked heads. When first sighted the birds occupied the cat-tail thicket in the shallow water near shore and the young were swimming and diving with the adult. As I slowly approached they became mildly frightened and swam away with the body submerged, only the head and upper neck appearing above the water. Although I was unable to find a nest I feel satisfied that the young were hatched in the sedge and cat-tail thicket bordering the shore.

Several times on subsequent days I found this little family here. On one occasion I watched the adult bird feeding the young. After a dive the parent came up with a small fish in its bill and swam toward two of the young ones while they also slowly approached the adult. The latter, still with the fish in its beak but without apparent movement to offer it to the young or to encourage them to take it, continued to move slowly toward one of the youngsters in a very matter-of-fact way as if to say, "Here it is; come and get it." This the fledgling did and then swam unconcernedly away. These birds remained here until well into July.

The pied-billed grebe also occurs sparingly on the open ponds of Cicero Swamp one and one-half miles southwest of Clay and in the exposed expanses of water and rushes bordering Mud Creek which flows sluggishly through the swamp. On July 2, 1929, an adult bird accompanied by two half-grown young, was seen on the quiet waters of Mud Creek, near the crossing of the Rome, Watertown and Ogdensburg railway tracks. While the adult was more wary, the young birds were feeding and diving quite unconcerned only a few yards from us. When pressed too closely they dived toward the thick growth of arrow arum lining the creek banks and took refuge in the small open-water areas among the broad leaves and fleshy stalks of that plant. More open water prevails here than in most other parts of the marsh, and with the floating duckweed and other buoyant plants, the great expanses of cat-tails, arrow arum and sedges, interspersed with the expanses of open water of various sizes, this area is altogether the most desirable of any that I have seen in the region for this little diver. In August, 1928, we had heard the bird "laughing" here but its resonant call seemed to be a more frequent sound in the marsh in the summer of 1929.

The only other place in which I saw this grebe locally during our investigations was among the sedges growing in the shallow waters of Oneida Lake, at Paddygut Bay; a single individual was seen here on August 10, 1928.

The well-known diving ability of the pied-billed grebe in common with other



Fig. 143. Grassy willow swamp near South Bay. Home of Wilson's snipe, American bittern and swamp sparrow. May 13, 1929.



Fig. 144. Looking southeast over Oneida Lake from a point about one mile north of village of North Bay. September 9, 1929. (Photograph by T. L. Hankinson).



Fig. 145. Sand beach along Fish Creek near village of Fish Creek Landing. Habitat of killdeer and spotted sandpiper. July 12, 1928.



Fig. 146. Hemlock, maple and birch woods one-half mile north of village of Cleveland. June 13, 1928.

grebes has earned for it various colloquial names indicative of a proficiency of performance in this direction: water-witch, didapper, dabchick, dipper and hell-diver are the ones perhaps most frequently used. In diving suddenly, the birds spring forward with the wings closely appressed to the sides of the body and disappear head foremost. When not alarmed or when feeding or swimming rapidly I have watched them sink slowly beneath the surface, leaving only the head and upper neck projecting; or, they may submerge entirely and for a considerable time, to reappear in quite an unexpected quarter some distance away. However, the facility with which the birds can disappear beneath the surface when occasion requires is amazing.

These grebes are more or less solitary, showing little tendency to flock or to occur together in a limited area; the latter habit is also manifest in the horned grebe while it is in this territory.

In addition to its diving ability the pied-billed grebe possesses, in common with the others, remarkable skill in swimming. Its long, lobate toes, short legs set well toward the posterior end of the body, the laterally compressed tarsi, the heavy waterproof plumage, the short concave wings and the absence of stiffened tail-feathers are some of the adaptations that make for expertness in this direction. In attempting to rise in flight the birds patter along for some distance on the surface of the water, at the same time vibrating the wings rapidly. A take-off of twenty or more yards is required before the bird acquires sufficient momentum to maintain itself in the air. When once under way it is capable of swift and sustained flight.

This bird constructs its nest of decaying vegetation such as reeds and rushes, piling the stalks on submerged plant material or rubbish so that a kind of floating mound is formed. Sometimes it is anchored to the surrounding cat-tails; and in Iowa I have seen nests in the open without any surrounding vegetation to hide them or to serve for anchorage. Four to eight dull whitish eggs make up the usual complement. The downy young are precocial and are able to swim almost immediately upon hatching. However, they follow the parent for some time and, as indicated in our observations above recorded, receive food and a certain amount of protection from her.

One peculiar item almost invariably present in the stomach of the pied-billed, as well as of other grebes, is a mass of feathers taken from its own body. In this species Wetmore (1924, p. 20) found that this material made up 52.5% of the stomach contents in the 180 stomachs available for study. However, the feathers were not taken into account in estimating the food percentages; feather substance can have little or no food value for a grebe. Just why these feathers are eaten and what function, if any, they may perform toward the bird's welfare is not evident. Wetmore's suggestion "that the feathers act as a strainer to prevent the passage of fish bones or large fragments of chitin into the intestine until they have been reduced to a proper size and condition by the process of digestion" (*loc. cit.* p. 4) seems altogether plausible.

The studies of Wetmore show that about 25% of the food of the pied-billed grebe is made up of fishes of several species, most of them of slight economic importance. Catfishes, eels, perches and some of the sunfishes are of value from

the standpoint of man, while suckers, carp, chubs, bream and the like are of lesser consequence. Crawfishes constitute 27% of the bird's food, while shrimp, prawns, crabs and the like make up 4%. Insects, mostly aquatic forms, such as true bugs, beetles, dragonflies and damselflies comprise a little more than 46% of its food. Among the predacious, aquatic forms taken by this grebe are to be found both crustaceans and insects that are inimical to small food fishes and which from this standpoint are injurious; so that whatever undesirable qualities the bird displays in destroying the fry of commercially valuable fish are compensated in this way. The widespread draining of many of the sloughs and marshes where once this and other aquatic birds repaired in numbers to breed has so reduced the area of desirable nesting places that neither this grebe nor any of its relatives is likely to assert itself as a menace to the fishing interests in the interior of New York State.

In the breeding plumage the brownish black upper parts, the grayish mottled under parts, the black throat patch and the short, thick, bluish-white bill with a black band near the middle are distinctive features.

ORDER CICONIIFORMES

HERONS AND BITTERNS: FAMILY ARDEIDAE

Great Blue Heron. *Ardea herodias herodias* Linnaeus.

One of the ever-present and most conspicuous birds of the Oneida Lake region is this large and wary heron. A stately and dignified bearing, keen eyesight, an acute sense of hearing and an artistic bodily outline all make for an unusual degree of human interest so far as this bird is concerned. The great amount of marsh land, numbers of isolated ponds, lakes and streams, vast areas of desolate swampy woodland, the lake itself with its several shoals, sandy islands and miles of rocky rush-lined shores, combine to offer a vast amount of territory favorable to the feeding and breeding activities of this large heron.

The great blue is our hardest heron and is said to be seen occasionally in winter about the open waters of springs and streams (Eaton, 1910, p. 254). However, in this territory at least, it occurs mainly as a migrant and summer resident, ordinarily first appearing late in March or early in April and departing for the South late in October or early in November.

We have observed the great blue heron almost daily in our field trips and at so many field stations that to enumerate them would be to record practically every important locality visited. So, without entering upon such details, it will be sufficient to point out the fact that the bird occurs most commonly in the immediate vicinity of Oneida Lake, a larger body of water such as this apparently appealing to it more than the small outlying ponds and lakes such as Vander-camp Pond, Francis Pond, Gordon Pond and Panther Lake. It is of interest to note, also, that the famous nesting colony in the Constantia swamp and also the one in the Big Bay swamp continue to exist, but in considerably reduced numbers as compared with their status twenty-five years ago. Perhaps the prevailing local conditions can be best set forth and at the same time certain of the habits and characteristics of the bird illustrated by transcribing here selected excerpts from my field notes. These have been arranged chronologically by

months without respect to the year, with the idea in mind that the actual sequence of occurrences in the summer life of the heron may be better portrayed.

"May 22, 1929. Considerable numbers of these birds in swampy woodland north of Shaw Point, i.e., in the Big Bay district. The species does not seem to be as common this season as in the summer of 1928.

"May 29, 1928. Shaw Point district. Three or four flying over.

"June 7, 1928. One feeding in a roadside creek near South Bay. As I drove by in the car the bird seemed quite unconcerned; but when I stopped a hundred yards beyond and walked toward it, the heron took flight immediately, scrambling awkwardly into the air with powerful strokes of its broad wings, its long legs dangling and its long, slender neck outstretched. Once under way the slow steady wing beats carried the bird rapidly forward; they are but little accelerated even under the stress of an aerial attack by a kingbird or crow or red-winged blackbird.

"June 19, 1929. From Wantry Island I could make out eleven of these birds feeding in the shallow waters off the bowldery shores of Long Island. When I approached this island about 6:00 P. M. the birds all left, some of them winging their way to other parts of the lake while others moved over to Wantry Island a half-mile away. As night comes on the birds leave the islands and most of them strike out for the Big Bay swamp district.

"June 22, 1928. This is a common bird here at Shaw Point and numbers of them are continually flying to and from the lake. A nesting place, which I did not reach but which I viewed with my glass from the top of a tall white oak tree in the swamp, occurs about a mile north of the point in a desolate, wooded, almost impenetrable (at this time of year) swamp which is formed by the backwater from Poddysgut Bay. The nests, of which I saw a half-dozen—probably there are many more that I did not see—are in the tops of tall dead or dying maple and white oak trees, from fifty to seventy feet up. Probably young are in the nests for the adults make regular trips to the lake, and Mrs. Stoner saw a bird carrying what appeared to be a fish in its bill. The bulky stick nests apparently are much less numerous here than they were forty years ago when every tall tree was said to hold from one to four nests.

"June 29, 1928. Potter Bay district, one-half mile west of Cleveland. Saw a dozen individuals of this species along the lake shore and in the tall trees near it, but could find no nests. This seems to be a favorite feeding ground for I have seen a goodly number of the birds flapping slowly over the lake from this point.

"July 6, 1928. Cicero Swamp, one and one-half miles southwest of Clay. Saw no great blue herons in the marsh or flying over it. This is not a favored habitat of the bird which seems to prefer larger bodies of more open water.

"July 8, 1929. Several birds feeding about open pools of water in the more exposed parts of the wooded swamp at Short Point. A good many birds also were perching in the tall dead trees.

"July 9, 1929. As I approached Wantry Island today, nine of the birds were resting on it and fishing in the surrounding shallow waters. Several of the herons flew to Long Island to join their fellows while others flew farther

away. Five or six birds were standing on a small gravelly knoll that barely projected above the level of the water, about one-half mile northeast of Long Island while, of course, the usual complement of birds was stationed on Long Island. I saw one bird alight in the water some distance off Wantry Island and remain resting contentedly for some minutes. The heron did not seem to be disturbed by a heavy wind and rain storm that came up suddenly; for a half-hour the wind blew very hard and the rain came down in torrents, but with the clearing of the skies the heron sat as serenely as before the deluge.

"July 16, 1928. Nicholson Point. Several birds in the grassy swamp and along the lake on the west side of Big Bay.

"July 19, 1928. On a late afternoon trip to Wantry Island, I saw two birds of this species preening themselves as they stood in the shallow water off the southeast end of Frenchman Island.

"As we approached Wantry Island I made out eight great blue herons standing on it; one or two of these were immature birds. Upon our approach they flew up, but later on other birds alighted there to devour fish which they had caught. One bird alighted near my blind, with a fish, apparently a whitefish (*Leucichthys*), at least ten inches long, which it held crosswise in its bill. After warily alighting on the shore it waded out into shallow water and proceeded to manipulate the fish preparatory to swallowing it; once it laid the fish in the water. Finally, after not more than a minute had elapsed, the fish, which appeared to be dead, was turned so that its head was directed towards the bird's throat and was partly swallowed, the tail depending from the open bill. After a moment the fish was swallowed quickly with a gulp or two, the sides of the bird's neck showing plainly the progress of the fish towards its stomach. The heron then sailed majestically away. The size of the fish swallowed by this bird rather surprised me.

"These herons are flying to and fro across the lake and near this island at all times. About 5:30 P. M. I counted nine birds in flight from the island. One bird that flew over had several primaries missing from each wing indicating that the molting season is at hand.

"July 24, 1928. The shallow water off the southeast end of Frenchman Island is a favorite feeding place for great blue herons. Here among the water lilies and rushes two or three birds can be seen at almost any time now. I believe, also, that the birds roost in the trees on the island, for under some of the larger ones I find the vegetation well bespattered with excrement.

"Another feeding ground at the south end of Long Island is habitually frequented by the great blue heron. A considerable area of shallow water with a rough bowldery bottom provides an excellent fishing place for the species here. Indeed, the entire island and its vicinity are visited by this heron in its search for food. At 4:50 P. M. I could make out with the glasses, as I stood on Wantry Island, fourteen of these birds standing in shallow water among the sedges that border one side of Long Island. Two hours later I counted nineteen individuals of this species on and in the immediate vicinity of Long Island where they were feeding in stately and solemn dignity.

"This morning, between the shore at Lower South Bay and Frenchman

Island, I saw a great blue heron that was flying slowly over the lake, suddenly volplane down to the water from a height of about fifty feet, and come to rest on the surface for a few moments while it seized a fish; then it rose into the air and continued its journey. The water here is more than fifteen feet in depth.

"This afternoon near Wantry Island I saw a heron alight in the water in the same way, but in securing its prey the bird *dived*, immersing its entire body for a few seconds, while it seized the fish, then arose from the water and flew away carrying the catch in its bill.

"About 6:30 P. M. the birds begin to move in toward Shaw Point and the Big Bay district where they spend the night and where also their rookeries are located. At this time one can see dozens of the birds coming from all quarters of the lake and its immediate environs, slowly flapping their way toward this concentration point. The procession of birds moving in a northwesterly direction across the lake to this gathering place continues until well after dark.

"July 26, 1928. Saw two great blue herons standing on Willard Island, a small round bowldery elevation, about three-fourths of a mile off shore at Bernhard Bay. This too, is a favorite feeding place for the birds.

"July 30, 1929. Verona Beach and Fish Creek districts. Saw only three birds all morning. This bird is not as common this season as it was in the summer of 1928.

"August 2, 1929. En route from Constantia to Long Island by motor boat we passed two small grassy shoals. On each shoal several great blue herons were standing, either in the long grass growing thereon or in the shallow water just outside the zone of grass. This is another favorite feeding place.

"This bird is commoner on and about the lake now than it has been at any previous time, for the adult population has been considerably augmented by birds of the year. Several birds were present on both Long and Wantry islands but they were very wary and I could not approach them. Long Island is well covered by a growth of long marsh grass. It seems that the herons have favorite stations along the water's edge where they stand while fishing, and in the immediate vicinity of these stations the grass has been killed out where the birds have continually voided their excrement. The rocks at the extremities of Wantry Island are also white with the excrement of these birds. At both Long and Wantry islands I found a good many dead fish, among them several lampreys that had been torn open and more or less mutilated. I suspect that some of the fish had been cast up by the waves and had been partially eaten by bald eagles, gulls, terns and other birds. Perhaps others had been left there by great blue herons. I have never seen a heron feed on mutilated or decaying fish.

"August 8, 1929. Arrived on Wantry Island at 5:45 A. M. Remained on this and Long Island until 1:00 P. M. Twelve great blue herons occupied Wantry Island just previous to my arrival there and several others were fishing in the shallow waters about Long Island, while other individuals of this species were constantly flying back and forth across Oneida Lake.

"At ten o'clock a bird came to rest on the water about one-fourth mile north of Wantry Island. While thus resting it seized a fish, swallowed it, then flew

away. The elapsed time from the moment that the bird alighted on the water until it took to the air again was about three minutes.

"Evidently this heron does not follow any hard and fast rule in the manner of securing its food but adopts any method that will produce the desired results. In the waters here I have seen it wade and spear, stand and spear, dive and grasp, rest on the surface of the water and seize, and spear in flight as the bird glided close to the water, then upward after seizing the prey.

"August 10, 1928. The great blue heron occurs in numbers in the trees of the Big Bay swamp bordering the east side of Big Bay. Along Three-mile Creek, too, the species is plentiful. The mouth of this, as of Big Bay creek, is a much-frequented feeding ground.

"On Wantry Island at 1:00 P. M. I counted fourteen of these birds. Several others could be seen on Long Island at the same time. These islands and their vicinity are a favorite fishing ground of the bird while the Big Bay swamp is the nesting and roosting ground. At all hours of the day the herons can be seen flapping to and from these districts.

"Today, on two different occasions, I again saw the great blue heron alight on the surface of the water and remain there for some time, as if resting before again taking to the air. Whether in these instances the bird actually caught fish I can not say, although I have seen it catch fish from such positions. The great birds seem to have no particular difficulty in arising from the surface of the water and are soon under full speed. When unhurried the business of getting under way is much more gracefully and less laboriously done than when a quick takeoff is necessitated through alarm.

"August 12, 1928. This morning at the Herbert Walker farm, which lies along the west side of Fish Creek near the village of Fish Creek Landing, I saw a great blue heron, two immature black-crowned night herons, a green heron and four American egrets all feeding together in the shallow waters of a small grassy pond. A few moments later an American bittern flew up from the grass near by; only the presence of the least bittern was required to make the picture complete. Seldom does one have the opportunity here to see five species of herons together at the same time.

"Young of the year are much in evidence now.

"August 13, 1928. Several great blue herons feeding among the sedges at the south end of Verona Beach this evening.

"August 13, 1929. On the little gravelly knoll about a half-mile northeast of Long Island, and mentioned in my notes above of July 9, 1929, I counted eighteen birds as I passed in a boat. Both adults and young are common now and they are continually flying over the lake in all directions until dark. The flight over the lake is not now so conspicuously in a westerly and northwesterly direction as it was a few weeks ago when young were in the nest in the Big Bay swamp and adjoining territory."

The above notations are sufficient to show that the great blue heron, or "blue crane" as it is called locally, is a common and generally distributed summer resident and breeding bird in the Oneida Lake region. Although the size of the breeding colonies has been considerably reduced, this heron continues



Fig. 147. In the field; cut-over tract one mile north of Jewell. June 8, 1929.



Fig. 148. Hemlock-maple woods about two miles north of Cleveland. Home of black-throated blue, black-throated green and magnolia warblers and oven-bird. June 13, 1928.



Fig. 149. Brush piles in clearing at edge of Vandercamp woods two miles northwest of Cleveland. Habitat of indigo bunting, red-eyed vireo, towhee and eastern field sparrow; also black-billed cuckoo in maple and aspen seedlings in background. June 25, 1928.



Fig. 150. Blueberry thicket and second growth trees one mile west of village of North Bay. Towhee habitat. May 16, 1928.

to breed in some numbers at its once more populous rookeries. The shores of Oneida Lake and the islands that dot it are inhabited all through the summer by this sagacious and picturesque wading bird.

A series of guttural croaks and squawks make up the principal vocal efforts of the great blue heron. During migration it gives vent to a hoarse "honk."

The huge nests of this heron often contain surprisingly large sticks, some of which are said to be from one-fourth to one-half inch in diameter. The flat nests vary from twenty-five to forty or more inches in diameter. According to Bent (1926, p. 105), four eggs are most commonly deposited; they are greenish blue in color. Apparently a good deal of variation occurs in the time at which the eggs are laid but in this region they are most likely to be found in May and June. From my observations on the young here I should say that the latter is the principal egg-laying month. The period of incubation is said to be about twenty-eight days, and the young spend four or five weeks in the nest. Sometimes they leave it and climb about in the trees before they are able to fly. During their early stages of growth they are fed by both parents by the process of regurgitation, in which soft and partly digested food is ejected from the mouth of the parent into the mouth of the young. Later on small fish are offered to the youngsters.

Although principally piscivorous in its food habits, the great blue heron feeds upon other aquatic, semi-aquatic and even terrestrial forms such as frogs, lizards, snakes, insects, crustaceans, mice and shrews. That the bird does frequent trout streams in this and other regions can not be doubted but on the whole most of the fish that it takes are of little commercial value and, in addition, it feeds to some extent on the enemies of young fishes. Altogether its economic status in this territory, so far as man is concerned, is probably beneficial or more or less neutral. There can be no occasion for making this heron the mark for every pot shot when legitimate game can not be found. For its unique appearance if for no other reason the bird might well be permitted to go its way unharmed.

The great size (forty-two to fifty-two inches in total length), the general bluish gray color, the long neck and legs and the broad wings which in flight move with slow, labored beats, are good field characters. During flight the head is drawn back between the shoulders and the feet are extended behind.

American Egret. *Casmerodius albus egretta* (Gmelin).

On August 9, 1929, I received a letter from Mr. Forest Walker, who resides on his father's farm just south of the village of Fish Creek Landing near the east bank of Fish Creek. The letter stated that some "white cranes" were in that vicinity and that if I would come to the farm I would be shown the birds if they were in their accustomed feeding place.

Accordingly, on the morning of August 12, I called upon Mr. Walker who immediately conducted me to a low-lying water-filled depression in an open, slightly rolling meadow adjoining the banks of Fish Creek. In the spring the pond was filled with water from the backwaters of this stream but as the season advanced the waters in the depression became isolated from the main channel.

A dense growth of marsh grass, water lilies and other aquatic and semi-aquatic plants grew about the margins of the pond.

As we quietly approached, the heads and long necks of two great blue herons first came into view, and a moment later the yellow bills, and pure white plumage of four adult American egrets were presented to our gaze. Of course the aigrette plumes were lacking at this season. The egrets were wary and took flight when we were about seventy-five yards from them, yet the great blues took off a moment earlier. The latter circled about for a short time, then settled in the tops of some tall trees on the opposite shore of Fish Creek, a half-mile away. In addition to the great blue herons and the egrets, two immature black-crowned night herons and a green heron were feeding about this grassy pond; and in a little swale a few rods away I flushed an American bittern, so that again five species of herons were found feeding together at the same time in practically the same spot.

We left the place after a few minutes, and when I returned a half-hour later the four egrets were again feeding in the pond. As I attempted to get closer in order to photograph them they took flight and settled in another shallow, willow-bordered pond about four hundred yards away. I attempted to stalk the birds there but without success, and they flew away to the rush-lined banks of Fish Creek and did not return while we were in the vicinity.

Mr. Forest Walker told me that the birds arrived there this year (1929) early in August and that they had fed about these ponds regularly and persistently since coming to this locality. He also reported that about this time of year in the 1927 season, a single egret put in its appearance and remained until late September. Although a sharp lookout was maintained for the species by the Walker family during the 1928 season they did not see it that year.

This is the first and only time that I personally have seen the American egret in the Oneida Lake region, but from this record and the report of Mr. Walker, I judge that the bird is likely to be found more or less irregularly in suitable habitats, during late summer. The low grassy swales adjoining Fish Creek and the willow- and rush-lined backwaters with exposed mud flats are particularly inviting to it.

Under date of September 10, 1929, I received the following communication from Dr. Charles E. Johnson, of the Roosevelt Wild Life Station: "I was informed indirectly by Miss Sadler, bird student, that about the first of this month there were 'six or seven' American egrets in the bay east of Locust Tree Inn, at Constantia. Mr. Spiker was out to the lake the other day, but saw none. After you left [August 15], Dence, Spiker and I went out to Fish Creek Landing and looked for the egrets. We saw only one; but doubtless the others were somewhere in the territory."

Of the previous records for the species in this part of New York State, Eaton (1910, sec. 2) gives the following data: Occasional summer visitant in Oneida County. Departs for the south November 10 (1889). Occasional summer visitant in Onondaga County. Departs for the south September (1895). Several records are cited by him for points not far from Oneida Lake: "Baldwinsville, N. Y., September, 1895. A. W. Perrior, '1896.' W. M. Beauchamp." This

locality is some twelve miles southwest of Oneida Lake. The next closest points are Deerfield and Marcy, N. Y., November 10, 1889. (Ralph and Bagg list, Auk, Vol. 7, p. 230.) Marcy is a little more than twenty miles east of Fish Creek Landing.

In addition Bourne (1921, p. 273) records a preserved specimen taken in August, 1887, at Mexico Point on Lake Ontario, in Oswego County, some twenty-five miles northwest of Oneida Lake.

The American egret inhabits temperate and tropical America and in eastern United States breeds locally from South Carolina southward. After the breeding season it wanders rather widely and since it has a tendency to move northward in late July, or in August or September, it is often reported from places that are ordinarily outside its regular range. This wandering habit is largely accountable for the central New York records such as my own and those of others cited here. Its status in the Oneida Lake region, therefore, may be indicated as that of a casual or occasional summer visitant, when single individuals or small flocks of three to five birds sometimes may be observed later in the season.

The large size (forty-one inches), pure white plumage, yellow bill and black legs and feet will at once serve to distinguish this heron which, thanks to Federal, Audubon Society and other protective measures is increasing somewhat in numbers after having been threatened with extermination.

Eastern Green Heron. *Butorides virescens virescens* (Linnaeus).

The eastern green heron is the commonest representative of the family in the territory about Oneida Lake. It is found along the creeks (Fig. 125), about the outlying ponds and lakes and in the swamps and marshes in the low country adjoining the lake, as well as about the shores of Oneida Lake itself and in the immediately adjacent swamps. Its diurnal habits, voice and universal abundance contribute toward making this bird, commonly called "fly-up-the-creek," generally known throughout the region.

Early arrivals from the winter home, which is principally in Mexico and Central America, are likely to put in their appearance about mid-April; but in this section I believe that the numbers are augmented by arrivals that come in as late as the first ten days of May, for the maximum of abundance does not seem to be attained until May 15 or thereabouts. Departure for southern quarters apparently begins in September and continues into October.

While an enumeration of all the localities in which the green heron was found to occur and to nest would be altogether superfluous, a few excerpts from my field notes which I have here arranged chronologically by days of the month, will give some idea not only of the localities that are most frequented by the bird, but also of certain features regarding time of nesting, behavior and other habits.

"May 21, 1928. Coble Bay and Big Bay districts; west side. Common, especially in Emmons' woods, a high tract about a half-mile west of Big Bay. Nesting in Emmons' woods now. Mr. I. O. Lamb who lives near by says that every morning from twenty-five to thirty of these birds leave this woods and fly toward the lake where they feed.

"May 22, 1929. Shaw Point district. More abundant here than I have seen it elsewhere in the region; no nesting places discovered today.

"May 25, 1929. Emmons' woods. Several birds found here today. Also discovered two nests. They were close together in a shady portion of the woods about twelve feet up in ash saplings. The tops of the saplings had been bent more or less together by the wind so that a kind of canopy was formed upon which rested the frail platforms of small twigs that served for nests. The nests were without linings and the pale greenish eggs were plainly visible through the nest materials from the ground below. I should think that a good breeze would cause the tops of the saplings to sway so that the eggs would be thrown out, unless a bird were sitting on them.

"June 13, 1929. Saw several birds in a boggy willow-maple-elm woodland on the west side of the mouth of Chittenango Creek. A likely nesting place.

"June 17, 1929. Emmons' woods. Found only one occupied nest today. Last season I found several nests here a little later in the summer. Mr. Lamb who lives near by tells me that four or five years ago the species was much commoner here than it is now. The nest (Fig. 179) that today was occupied by five downy white young a week to ten days old, contained eggs on May 25. Fragments of egg shells lay on the ground beneath the nest. The young birds were banded and photographed. In these procedures we handled them freely but they made not the slightest attempt to disgorge the contents of the crop, a trait that is said to characterize the young of this heron.

"June 22, 1928. Shaw Point district. This bird is common here. Found a small nesting colony in the low-lying woods on Shaw Point, and another isolated nest in the woods about three-fourths of a mile north of the point. The nests at Shaw Point are about twenty feet up in ash and maple saplings which form more or less of an undergrowth among the larger trees. One of the nests contained eggs which had been incubated slightly. While I was examining the conditions here the adult birds were flying about, continually uttering the characteristic hoarse croaking note '*skew-ah*.'

"June 26, 1928. Fish Creek Landing and vicinity. Fairly common in the marshes adjacent to the creek.

"July 2, 1929. Cicero Swamp one and one-half miles southwest of Clay. This is by far the commonest heron in the swamp; almost any minute, two or three or more birds can be seen in flight above the cat-tails. I believe that it breeds in the more sparsely wooded sections near our place of observation on the railroad track that runs through the swamp. The birds seem to be making regular and purposeful trips, not simply aimless flights, about the swamp, and I suspect that they are feeding young.

"July 6, 1928. Cicero Swamp one and one-half miles southwest of Clay. A very common bird in the cat-tail marsh section here. Its hoarse '*skew*' can be heard on all sides. I think that the birds nest in the small trees along the edge of the marsh for they appear to make regular and frequent trips to those parts; but so far I have been unable to discover nests.

"July 8, 1929. This A.M., along the low flat shores of Oneida Lake, about a mile south of Short Point, I found an empty nest twenty-five feet up in

an ash sapling. This sapling grew in a thicket of small elms, ashes, willows and maples of just the type so frequently selected here by the green heron. Egg shells lay on the ground under the nest but there were no young birds in it. Possibly they had left it safely previous to my arrival for it is well known that they climb about among the branches of the trees some time before they are able to fly.

"July 11, 1928. Cicero Swamp, one and one-half miles southwest of Clay. Very common here and the hoarse *skeow* or *keough* is heard on all sides. It is more active toward evening than at mid-day and although it possesses a slow, labored type of flight it is, altogether, less awkward and vascillating than that of the bittern or of the great blue heron. These birds make regular trips to a wooded part of the swamp a half-mile away where I think they have young in the nest.

"July 16, 1928. Emmons' woods. Found several birds in this woods, in the woods immediately west of Big Bay and in the wooded tract south of the West Monroe Cemetery. Birds of the year were observed at all three places. At the lower part of the Emmons' woods, in a growth of maple, ironwood and other saplings, I found several nests, now unoccupied, about sixteen to eighteen feet up. Earlier in the season (May 15) I found two nests in another and denser part of this woodlot. The birds frequent this spot in numbers now.

"July 17, 1928. Cicero Swamp, one and one-half miles southwest of Clay. Late afternoon and evening; common; flying back and forth over cat-tails and at times alighting among them at the border of a small pond or pool. One individual that flew over had apparently begun to molt, for a vacant space about the width of two primaries showed at the same place in both wings—ordinarily the principal wing feathers are molted symmetrically and evidently the phenomenon was taking place in this bird.

"July 28, 1928. Fish Creek railroad station. One bird in a pool at side of railroad track; a bird of the year able to fly fairly well, standing in shallow water on the mud beach of Oneida Lake, near the Barge Canal. This is a favorite feeding place of the green heron.

"August 7, 1928. Cicero Swamp, one and one-half miles southwest of Clay (Fig. 165). Both adults and young of the year very common; flushed several as I poled a boat up Mud Creek. The birds were flying to and fro all the afternoon until almost dark. The red-winged blackbirds and kingbirds pursue and torment these herons unmercifully in their slow labored flights over the marsh. Not infrequently the herons are driven to the cover of the cat-tails and arrow arum by their active little enemies.

"August 10, 1928. By motor boat from Brewerton to Big Bay, the district on the east side of it, about Big Bay and Three-Mile creeks and to Long and Wantry islands. The green heron is very common in the Big Bay swamp where sometimes as many as five or six birds may be seen standing on the branches of a single dead tree. The species seems to be rather well concentrated just now. Seldom do these herons fly far out over the lake, a habit which was noted in the great blue heron. Neither today nor at any other time have I seen a green heron on either Long or Wantry Island.

"August 12, 1929. Extreme south end of Verona Beach. At this point a good many rushes occur and I have frequently observed this heron standing still among them or stalking slowly along the lake shore. A bird that I saw here today displayed scavenger-like characteristics in feeding upon a dead fish washed up by the waves."

The above remarks will serve to show that this heron is a common summer resident in the region and that it nests either singly or in small colonies in suitable habitats, of which there are many. No doubt numerous other wooded situations that harbor nesting birds escaped me. Occasionally birds are found about the outlying ponds and lakes north of Cleveland, Jewell and North Bay but the species is less common in those localities than in any other part of the territory under consideration.

The food of the green heron consists principally of small frogs, fish, leeches, snails, tadpoles, crayfish and insects. In some cases grasshoppers have been found to constitute a surprisingly large percentage of the stomach contents. This food is secured either by waiting patiently in some selected spot or by walking along slowly and carefully. In either case the prey is seized or transfixed by a sudden thrust of the bill. The bird is said sometimes to destroy small trout in streams and artificial ponds, on which account it has incurred the ill-will of fishermen and sportsmen. On the other side of the ledger, however, are the minnows, crawfish and large aquatic insects all of which are more or less of a menace to fingerling trout; the grasshoppers and locusts which it takes are also inimical to man so that, on the whole, the beneficial qualities of the bird seem to balance if not to outweigh its injurious proclivities. There is no occasion whatever for shooting this heron; its interesting traits and tendency to visit and sometimes nest near human habitations might well be capitalized, for its presence affords welcome diversion from the routine of everyday life.

The small size, long neck, general greenish black upper parts, chestnut colored neck and sides of head and short tail are good field characters. Like the other herons it flies with its head drawn back to the shoulders and its yellowish legs and feet directed backward. When not fishing it usually rests in a tree and will often stand practically motionless for long periods of time. This is particularly true after the breeding season. When alarmed it has the habit of raising and lowering the elongated feathers which form its crest.

Black-crowned Night Heron. *Nycticorax nycticorax hoactli* (Gmelin).

The only sight record we have of this bird at Oneida Lake for the 1928 season is May 3. On this date an adult alighted in a tall tree along Chittenango Creek, in the Froher Bay district. The bird remained there for some time, then flew away to the adjoining woodland.

On May 16, 1928, I saw in the lobby of the Central Hotel at North Bay a mounted male in breeding plumage. The proprietor said that the bird had been shot near the lake in that district in 1926. It was considered a great rarity for no one among the local residents had ever seen the species before and the specimen had remained unidentified until my visit.



Fig. 151. Emmons' woods from west side. West side Big Bay. Maples and hemlocks. Habitat of cerulean, magnolia, black-poll, redstart and other warblers and of scarlet tanager and olive-backed thrush. May 21, 1928.



Fig. 152. Scene in hemlock-maple portion of Emmons' woods. May 21, 1928.



Fig. 153. Pond three miles north of Cleveland. Habitat of eastern red-winged blackbird, black-billed cuckoo, redstart and oven-bird. June 10, 1929.



Fig. 154. Panther Lake looking west along north shore. July 30, 1928.

In the hunters' cabin on the F. C. Soule estate near Cleveland is another specimen of this species. It is in immature plumage, and Mr. Torrey Steenburg, the game keeper on the estate, informed me that the bird was killed on the premises in August, 1927.

In the 1929 season I saw the species on only two occasions, June 18 and July 2. On the earlier date four individuals, three adult birds and one in immature plumage, were seen in the small, sparsely distributed elm trees along Mud Creek, in the cat-tail marsh one and one-half miles southwest of Clay. Two adult birds were seen first; they did not remain long but flew away and returned in a short time accompanied by another adult and the immature bird. On the latter date two adult birds and an immature individual were seen at the same place, flying over the swamp. Probably they were the same ones seen on June 18.

It is altogether possible that a rookery may exist in the inaccessible wooded section of the swamp near by, for the behavior of the birds on this occasion suggested that they were perfectly familiar with the surroundings and would remain for a time.

Sadler (1926, p. 5) lists this bird as a summer resident and mentions the discovery of a rookery near Long Branch, about five miles northwest of Syracuse. From our observations and the available information it seems that the species occurs casually in the Oneida Lake region and may even breed. Unfortunately, however, the probability that so large and unusual a bird will long escape the local nimrods is not great and, its numbers here are not likely to increase in the near future.

With reference to the earlier records of the bird in this region, Bagg (1897, p. 227) states that "Mr. Klock, an Oneida taxidermist, reports several females (or young?), from Oneida Lake," while Maxon (1903, p. 263) says that this heron "may be put down as an occasional transient visitant" in Madison County. No dates are given, but the records suggest that the species is now about as common in the region as it was twenty-five or thirty years ago, when it is probable that it bred sparingly, as seems to be true now.

The first spring arrivals are likely to put in their appearance about mid-April. Following the close of the breeding season, young birds in particular have a tendency to wander and it is not unlikely that the local status of this heron is modified in late summer by individuals that have wandered northward.

This comparatively short-legged heron differs somewhat from its relatives in its stockier build, its distinctly nocturnal habits, and in its manner of flight which is somewhat like that of a gull. The neck is comparatively shorter than in our other herons and during flight is not held in such a close sigmoid flexure as is characteristic of them. The ordinarily quicker wing strokes carry the bird along in a strong, direct flight. "Its periods of greatest activity are from dawn till sunrise and from a little before sunset until after darkness has settled; but it is never quiet, day or night, in a night heron rookery." (Bent, 1926, p. 208.)

The latter statement I can emphatically attest, for while I have not found a nesting place in this region, I have visited one in southern Minnesota where some 200 or more birds were nesting, and I can vouch for both the noise and the odor that emanated from this rookery.

This heron is gregarious and social and usually nests in colonies in outlying wooded sections from early May to mid-July. Ordinarily the nest is crudely built of sticks and twigs. Where woodland is not available the bird nests on the ground or in shrubbery. Three to five bluish green eggs make up the usual clutch, and the period of incubation is said to be from twenty-four to twenty-six days (Gross, 1923, p. 197). Both sexes take part in incubation and the young are fed by their parents until they are old enough to shift for themselves.

The characteristic note of the black-crowned night heron is a hoarse "quawk," "squawk," or "quark," not so guttural as that of the green heron and uttered with a more rapid cadence. These notes are often heard as the bird flies to and from its feeding place and are responsible for some of the various colloquial names by which the species is known.

The marshy borders of ponds and lakes and the banks of streams are the favorite resorts of this bird when searching for food, which consists principally of fish, mollusks, crayfish, insects and other aquatic and semi-aquatic forms.

The black bill, the greenish black crown, upper back and scapulars, the ashy gray wings and the white forehead, lores, neck and under parts are distinctive. In the breeding plumage two or three white plumes from six to eight inches in length depend from the occipital region of the head.

American Bittern. *Botaurus lentiginosus* (Montagu).

The numerous grassy bogs, marshes and cat-tail and willow swamps that occur so generally throughout the Oneida Lake region, particularly in the territory to the south and east of the lake, offer an abundance of favorable habitats for the American bittern. This solitary bird is regularly and generally distributed in its favorite haunts throughout the summer.

Early in April the first arrivals from the winter home, which extends from the Southern States to Panama, put in their appearance, and almost immediately their loud, guttural "pumping" becomes one of the notable and characteristic sounds issuing from the marshes. The autumnal movement occurs mostly in early October.

An enumeration of the places in this region in which we have observed the American bittern would include practically every grass and cat-tail marsh visited. As in the case of so many other marsh-loving birds, a part of the Cicero Swamp lying southwest of Clay seems to be the area of local concentration of this bird. Here we found it in greater numbers than elsewhere, although, in the similar, smaller marshes such as the ones in the Hall Island, Fish Creek, Black Creek south of Bridgeport and Lakeport, Short Point, Shackleton Point, Toad Harbor, West Monroe, Nicholson Point and Big Bay districts, one could always be sure of finding the species represented. Except in the immediate vicinity of the outlying ponds and lakes, the Cleveland, Jewell and

North Bay districts do not appeal to this bittern, for the wooded sections and high banks are not the type of habitat suitable to it. However, ponds and streams not too closely surrounded by woodland, such as Vandercamp and Gordon ponds, are sometimes visited by it, though of course the low, flat, open marshy conditions offer greatest appeal to this heron.

This bittern is not an energetic bird but spends most of its time standing still in a marshy retreat or stalking slowly about with stealthy and noiseless movements as it searches for food in the sloughs, bogs and marshes. When slightly disturbed it points its bill upward, contracts its body and remains motionless so that the vertical stripes on the loose plumage of the throat, neck and breast blend with the lights and shadows cast by the surroundings, thereby rendering detection of the bird difficult. This so-called "freezing" attitude is employed frequently by the bittern which relies so confidently upon this ruse that one can often approach very near to it before it takes wing. When in this position the bird is likely to be mistaken for a dead reed stalk or crooked stake. I have often approached to within twenty or thirty feet of a perfectly motionless bird which, as I came nearer, kept its eyes steadily on me. Finally, after apparently giving up the notion that safety might be had in this way, it sprang awkwardly into the air with loosely flapping wings and dangling legs, giving a hoarse "*onk-onk*," and discharging characteristically a huge splash of excrement, flew away to another part of the marsh. Even when undisturbed and standing or walking quietly along in its usual fashion the white streaks intermingled with the soft brown of the bird's plumage render it quite inconspicuous against a background of flag stalks and leaves.

On May 7, 1928, in a grassy willow and alder swamp in the South Bay district, I saw a bittern not more than fifty feet from the State highway. It seemed quite unconcerned at the frequently passing motor cars and indulged in its well known "pumping" sounds at frequent intervals. At times it "froze", but it soon took courage and walked about in its usual methodical manner. These birds are often seen in the long grass at the sides of the highway and in the fields adjoining. As a rule they give little heed to the automobile traffic but if a car stops in their vicinity, or if an unusual sound is heard, the long neck and bill are at once directed skyward and the characteristic attitude assumed.

A different interpretation of the value of this upright attitude is offered by Saunders (1926, p. 401) who contends that with its head in this elevated position the bird can see an object such as an approaching human or other animal with *both* eyes, and that it assumes this posture in order to see better. When hunting for its food an object such as a frog or other small terrestrial form would be below it, so that with the bill held horizontally or nearly so, binocular vision is possible without resorting to an erect posture. No doubt there is some merit in this explanation, although it is difficult entirely to discard the idea that this attitude is not distinctly protective.

Probably the most characteristic performance of the bittern is its well known "pumping" or booming which is most frequently indulged in early in the morning and again toward evening, during the breeding season. The resonant "*pump-er-*

lunk"—which has been given numerous printed renditions—is accompanied by varied and apparently agonizing bodily contortions on the part of the bird. According to latest and most authentic observations, it is produced by the enlarged gullet, which at this season undergoes a special development of its muscular tissue so that it forms a sort of sound-producing bellows. This pumping sound is a part of the nuptial performance and is responsible for one of the expressive colloquial names—"thunder-pumper"—which the bird has acquired by reason of the resemblance of the note to the sound made by the action of an old wooden pump. Another name, "stake-driver," has been given the bird because of the fancied resemblance of its note to the sound produced by driving a stake into soft ground. The variation in the sound produced has been, in part at least, responsible for these and other human interpretations of it.

Not only are the vocal efforts largely a development of the breeding season, but the male at this time also indulges in a display of the nuptial plumage. In addition to a kind of strutting performance the birds are said to display the delicate white plume-like growth that appears upon the interscapular region. The tips of these feathers can be elevated to form a kind of ruff about the lower neck or depressed so that they appear as white patches against the background of denser brownish plumage. Apparently the "pumping" and the display may go on simultaneously. (Bent, 1926, p. 74.)

The nest of the American bittern is usually well concealed in cat-tail marshes or grassy bogs. It is simply a platform of weed stems, grass and other vegetation placed on or near the water, on a support of mud or plant growth. The four or five brownish eggs are usually deposited sometime between May and July 1.

On May 29, 1928, Mr. Ed. Nicholson of Brewerton told me that on the preceding day, in a grassy marsh near the Toad Harbor road, he had found a nest containing four eggs. This locality and Cicero Swamp south of Clay are the two most extensive and likely breeding habitats in the region. On May 2, 1929, in the cat-tail marsh at the latter place, I saw a pair of bitterns in copula. Throughout June the bittern is a common bird here and the hoarse croaking note can be heard on all sides while the birds themselves are continually flying back and forth over the cat-tails. While pursuing their way slowly across the swamp the birds are often attacked by red-winged blackbirds. On such occasions the harassed bittern soon finds it expedient to take refuge in the tall dense grass and rushes, rather than to attempt escape by flight. Not only the red-wings exhibit this hostility toward the bitterns, but also barn and other swallows frequently join in the attack; and of course the kingbird is always ready to sally forth from its perch to attack a passing victim.

A number of field notes chronologically arranged by months will set forth our principal findings relative to the occurrence, breeding activities and behavior of the young in the region and will supplement and illustrate certain of the general statements previously made on this species.

"July 6, 1928. Very common in the Cicero Swamp south of Clay. Evidently breeds here for adults are flying to and fro in numbers. Also saw one bird with the scant, hair-like juvenal feathers still clinging to its plumage. I

watched this bird for some time at a distance of fifteen feet. At intervals it hunched its back, partly spread its wings and at the same time snapped its mandibles together after the manner of an owl in an apparent effort to frighten me away. It made no attempt to 'freeze' but half-squatted motionless for short periods. All the while it watched me closely."

The above is my earliest date for young of the year, but they were common all over the region throughout the month of July.

"July 7, 1928. Cicero Swamp southwest of Clay. 5:00 a.m. Common in the marsh. Breeds here. Saw one young with white down still clinging to the feathers on top of its head.

"July 13, 1928. Shackelton Point district. In a water willow swamp south-east of this point I came upon a bittern of the year with some of the natal down still clinging to the feathers on the top of its head. The bird was among the rushes, partly clinging to the branches of a small willow, in water about six inches deep. As I approached I noted the bird eyeing me, with its bill and neck elevated, and as I came closer its wings were partly extended as if to make itself loom large. At the same time the fore-neck was inflated to three or four times its normal size; and the feathers covering the entire body more or less erected. At my still closer approach, the bird began to utter a sort of vibratory hissing sound, which bore some resemblance to the rattling of a rattlesnake, accompanying this action with a rapid snapping together of the mandibles. Sometimes it opened its bill wide and hissed, while again it would lunge forward, hissing and striking at me with its bill. As I approached slowly to within a distance of eight feet, the bittern squatted down in the willows, lunging and hissing but making no effort to escape. I approached still closer, and the lunges became more vicious. Suddenly it dropped from its perch in the willows and made off rapidly through the muddy water to the thicket near by, running rapidly although I think that the bird was able to fly. The exhibition of the 'defense posture' of the bittern extended over a period of perhaps fifteen minutes.

"July 16, 1928. Coble Point district. At a roadside marsh Mrs. Stoner saw a bird of the year, able to fly and attended by an adult. Also saw another young able to fly.

"July 17, 1928. Cicero Swamp southwest of Clay. Mrs. Stoner observed a young bird here that was about two-thirds grown.

"August 3, 1928. Grassy swamp about one-half mile west of West Monroe railway station. Saw one adult, and one young of the year.

"August 7, 1929. Cicero Swamp southwest of Clay. A good many bitterns flying back and forth in the swamp. About dusk one rose from the cat-tails. In flying low above Mud Creek it struck one of the high tension wires which are carried through the swamp on tall steel posts. The bird came hurtling into the swamp below and was probably injured if not killed by the impact. Undoubtedly a good many birds meet injury or death in this way. Evidently they can not see well toward dusk. A few minutes earlier a duck—I could not identify it in the poor light—flew into the wires fifty yards north of the place where the bittern had met with disaster.

"As soon as the bitterns rise from the cat-tails they are pursued by king-birds, red-wings or barn swallows and usually are forced to take cover in the dense cat-tail growth."

The food of the American bittern consists of all kinds of smaller animal life commonly found in the marsh. Frogs and small fish seem to be its favorite food, while meadow mice, lizards, small snakes, crayfish, mollusks and insects provide variety in abundance. These forms are usually impaled on the long, sharply-pointed bill as the bird darts out its neck while moving stealthily along through the marshes. In spite of the abundance of its favorite food this bird, in common with the other herons, always presents an emaciated and ill-fed appearance.

The large size, terrestrial habits, general light brown, streaked and mottled coloration and the long yellowish green bill are good field characters of this bittern. In addition, a wide black streak extends along the side of the upper neck, the broad wings are tipped with brownish black and the legs and feet are greenish yellow. The broad wings permit only of a slow, rather labored flight, during which, as in other herons, the neck is drawn in and the feet extended behind.

Eastern Least Bittern.

Ixobrychus exilis exilis (Gmelin).

In the Oneida Lake region this small bittern is a less common and generally distributed summer resident than its larger relative, the American bittern. So far as I was able to determine, its center of local abundance is in the cat-tail marsh one and one-half miles southwest of Clay where, indeed, it seemed to be as common as if not commoner than the American bittern. However, its more circumscribed distribution is at once apparent for in all our field work in the immediate vicinity of the lake I saw it only in the Coble Bay district just northeast of Nicholson Point, where a single example was recorded on May 21, 1928.

Concerning the occurrence and habits of the least bittern in the Cicero Swamp south of Clay I have the following field notes to offer.

"May 18, 1929. Several birds observed here this evening, at which time the species seems to be more active than during mid-day. This bittern does not fly so great a distance in a single flight as does the green heron with which it is so often associated, but skims along in a straight line just above the tops of the tallest cat-tails. Evidently this bittern is nesting here.

"July 2, 1929. 4:15 to 8:15 P.M. Saw a half-dozen birds. Its flight is awkward, labored and vacillating and the bird soon settles down into the tall rushes much after the manner of a Virginia rail.

"August 7, 1928. Saw five of these birds here in the swamp along Mud Creek as I poled up-stream from the railroad bridge. At least one of the birds was a juvenile, for although it could fly fairly well, yellowish down still clung to the feathers on the top of its head. Apparently these birds like to feed along the edges of running water, for all of them were flushed from



Fig. 155. Francis Pond about four miles northwest of Cleveland. A favorite resort of eastern bluebirds, tree swallows, eastern belted kingfishers and great blue herons. July 28, 1928.



Fig. 156. Looking east across Kibby Lake. June 15, 1928.



Fig. 157. West end of Kibby Lake. Hemlocks and maples in background. Pond lilies and some duckweed on water. June 15, 1928.



Fig. 158. Maples, birches and a few beeches. Sauers' woods south of West Monroe cemetery. May 8, 1928.

such situations. If the entire marsh is as heavily populated with this species as the small area that I covered today suggests, there are scores of the birds here. Its abundance is more apparent now than at any previous time.

"August 9, 1928. 1:15 P.M. to 7:00 P.M. Several birds flew up from the cat-tail rushes along Mud Creek, among them a juvenile with yellowish down still clinging to the top of the head. This youngster had a very weak and vacillating flight. From the number of birds seen today and on former visits here, it seems that this is a favorite breeding place for the species, which must be rated as a fairly common bird in this part of the swamp."

This shy and secretive little bittern may be expected to arrive in this region from its winter home—which is in Florida and southward to South America—early in May, and its departure for southern quarters occurs mostly in September. Evidently it is not so hardy a bird as the American bittern, for it arrives here later in the spring and leaves earlier in the autumn.

While in its summer home the eastern least bittern, like the rails, prefers to remain concealed for the most part and does not venture into the air except for short flights such as have been described above. On the other hand it is particularly adept at climbing among the rushes a little above the surface of the water. Its long, slender toes are well adapted to this end. It is somewhat of a skulker, too, its small size, long slender head and neck and emaciated body facilitating such habits. Although this bittern often perches among the cat-tails by clinging to a single stem or to two adjacent ones, I have observed it perching also in low trees and bushes.

On account of its quiet manner, disinclination to fly and its protective coloration the presence of this bird is, no doubt, often overlooked and its true status in a locality remains unknown. During the breeding season "its mellow cuckoo-like call, *"coo-coo-coo"* (Eaton, 1910, p. 252), is more often heard than its author is seen. It is one of the numerous and characteristic marsh sounds among the flags and arrow arum in the swamp south of Clay.

When alarmed or excited the least bittern adopts a pose similar to that previously described for the American bittern, and its protective resemblance in form and color to its surroundings is perhaps even more striking than in the case of that species. Dr. Arthur A. Allen tells of an experience that he had with an incubating bird of this species and I quote briefly from his somewhat lurid description: "The feathers were fairly glued to the body, and the head and neck appeared no thicker than some of the dried reeds that composed the nest. The bill, pointing directly upward, widened barely appreciably into the head and neck and the feathers of the lower neck were held free from the body and compressed to as narrow a point as the bill at the other end. The neck appeared to be entirely separate from the body, which was flattened, so as to become but a part of the nest itself. There was not a movement, not even a turning of the serpent-like eyes which glared at me over the corners of the mouth. Every line was stiff and straight, every curve was an angle." (1915, p. 427.)

Although I found no nests of the least bittern, the above-cited sections from my field notes indicate that it breeds regularly in the cat-tail swamp southwest of Clay.

The circumstances surrounding my finding of this bird in the Coble Bay district on May 21, 1928, were such as to lead me to suspect that the species nested there. This was confirmed on June 23, 1930, when Mr. Wilford A. Dence, of the Roosevelt Wild Life Station, on returning from a field trip to this place told me that in a little area of cat-tails, perhaps 100 feet in circumference, he had flushed a bird from a nest containing four eggs. The nest was resting upon dried flag stalks that had been bent down so that they were not more than three inches above the level of the water (Fig. 180).

The flat nest is usually placed a short distance above the water in a close-set group of flags; the tops of some are bent down and interlaced to provide a foundation for the nest which is composed of flags or other swamp vegetation. The usual complement of eggs is four or five; they are bluish white in color and unmarked. Both sexes are said (Bent, 1926, p. 86) to take part in the incubation which lasts sixteen or seventeen days. Sadler (1926, p. 5) records nests with eggs near Syracuse on June 17, 1916, and on June 30, 1920. On the former date a recently completed nest without eggs also was found. My own records of nearly full-grown young in early August fit in well with these observations.

This stealthy marsh- and bog-inhabiting bird doubtless feeds largely on such aquatic and semi-aquatic forms as frogs, tadpoles, fishes, snails, leeches, slugs and insects. Probably neither this nor the American bittern is of much direct economic importance so far as man is concerned, unless possibly in their destruction of tadpoles and frogs. At the camps, hotels and wayside stands about Oneida Lake frog legs are much in demand, and during the season professional "froggers" scour the marshes and swamps of the region in their efforts to gain a livelihood and, at the same time, to supply a table delicacy for those who can afford to pay for it. I am told that in a good season the frogger receives from \$.50 to \$1.00 a pound for the frogs' legs (24 to 26 frogs) and I suspect that any bird or, for that matter, any other competitor in this field of endeavor, is considered a menace by the frogger. However, I believe that the number of frogs as compared with the number of least bitterns and other herons is sufficiently large so that both the froggers and the herons receive a fair share. Nevertheless it is said that frogs have become comparatively scarce here during the past few years, but I suspect that this is due to the abundance of froggers rather than to any material increase in the number of frog-eating birds.

The male has the crown, back, rump and tail glossy black; back of neck chestnut; sides of head and neck and under parts buffy yellow, paler on throat and front of neck. Wing linings and axillars buffy white. Bill pale yellow; legs green. Female similar, but brownish where the male is black; under parts darker and lightly streaked with black.

The conspicuous amount of pale buffy present on this retiring little marsh bird will serve readily to distinguish it.

ORDER ANSERIFORMES

DUCKS, GEESE AND SWANS: FAMILY ANATIDAE.

Common Canada Goose. *Branta canadensis canadensis* (Linnaeus).

On May 3, 1928, two belated migrants of this species were flushed from a protected cove on Oneida Lake at the mouth of Chittenango Creek. I did not see the species on any other occasion here, but it occurs in numbers on and about the lake during both spring and fall migrations. These movements take place, for the most part, before and after the period covered in this report. Dr. C. E. Johnson reports that he saw several Canada geese on Oneida Lake, opposite the mouth of Chittenango Creek, on April 12, 1927.

Regarding the occurrence of this bird in the State, Eaton (1910, p. 232) says: "While most species of our wild ducks have been rapidly decreasing in numbers, the wild goose has apparently held its own in New York, probably because the breeding grounds of those geese which visit our State have not yet been disturbed by the development of the northwest. Our geese undoubtedly breed in western Labrador and the Hudson Bay region and cross the country at large in their migrations, not following the lakes as much as the ducks which come to us from the interior."

The Canada goose is one of the best known of the North American water fowl, its association in flocks during the periods of migration and its loud honking always attracting popular attention. Although the often described wedge-shaped formation is maintained by geese when flying high and continuously, a flock usually maintains a single, long, diagonal line. This orderly manner of flight may be continued for considerable periods of time. The speed at which geese fly has frequently been overestimated; perhaps a rate of thirty to forty miles an hour is most common. Flight is maintained by relatively slow powerful flaps of the wings; considering their size, these birds are excellent flyers. In rising from the water or from land they usually run along for a few steps to gain momentum before taking to the air but the two individuals that I flushed on May 2 sprang at once from the water without any preliminary running.

Except in unfavorable weather, Canada geese do not frequent the inland waters of the State in great numbers. They are wary birds and though gregarious and associating in flocks some individuals of the group are always on the alert.

With the encroachment of human activities on the once extensive nesting domain in the north central part of the country, the breeding range of the Canada goose now has become considerably curtailed but even under these restricted circumstances it seems at least to be maintaining itself satisfactorily.

Nests with eggs occur mostly in May and June. The nest of twigs, reeds, grasses and the like is lined with down and is placed upon the ground. The usual complement of eggs is five or six. Incubation requires from twenty-eight to thirty days (Bent, 1925, p. 209) and is performed by the female.

The winter range of the eastern birds is mainly in the Gulf states.

This goose subsists largely upon the stems, seeds, roots and leaves of aquatic and other plants, as well as upon the small animal life that occurs in the flooded

marshes, its favorite feeding grounds. Cultivated fields bordering streams and marshes also are visited by the birds, where waste and unharvested grains are taken as a part of the diet. Sprouting grain is sometimes eaten.

From an economic standpoint the Canada goose is important. Its flesh has been and, in some places, still is an important item of food. As a game bird it ranks high, and in attempting to maintain it in this capacity, artificial propagation has been undertaken by several states as well as by numerous private organizations and individuals. The bird breeds and thrives in captivity.

The large size, black head and neck, white cheek patches and black bill and feet provide ready determination in the field.

Common Black Duck. *Anas rubripes tristis* Brewster.

The common black duck or black mallard as it is called locally is an abundant transient as well as a moderately common summer resident and breeding bird in the Oneida Lake region. Between May 1 and August 15 it is by far the commonest species of duck in this territory.

Although no doubt individuals of this species can be found occasionally all winter about the open waters of Oneida Lake, in the vicinity of springs, the black duck is typically a migrant and arrives here about March 1 from its winter range which, in the East, commonly extends from the New England coast to Florida. Large numbers of the species have moved on farther north by May 1, so it is likely that most of the birds seen here during the period of our investigations were either locally breeding birds or the progeny of such. Ordinarily, it is not until late September or early October that arrivals from farther north put in their appearance here in any numbers.

The local status of this bird as I found it in this territory may be appropriately considered by calendar months throughout the period of my investigations.

During May single individuals and pairs of birds were observed frequently in several bays on Oneida Lake,—Maple Bay (Fig. 125), South Bay, Shaw Bay and Delmarter Bay are typical. On May 22, 1928, a flock of over 100 individuals was observed at Constantia Bay. It is unusual to find so large an aggregation of these birds here at this season. Possibly it was made up of belated northward moving ducks.

At Cicero Swamp, one and one-half miles southwest of Clay, the black duck appeared to be even commoner than on Oneida Lake. The cat-tail swamp with open pools and ponds of water scattered through it, and the nearby woodland, all combined to make a satisfactory retreat for it here. Although I saw no young birds here in May, Messrs. C. J. Warner and W. Shepard, who live in the vicinity of the swamp, told me that the black duck breeds in this locality.

With respect to the breeding of the bird here during this month I may say that on May 22, 1929, I came upon a female accompanied by eight or ten young, in a willow-clad bayou at Shaw Point. The adult was very wary and immediately led her charges away among the dense undergrowth. Mr. C. Shaw who lives here said that the black duck is not an uncommon breeder in this locality.

A resident of the Constantia district told me that on May 19, 1929, he had seen an adult accompanied by sixteen young in the willow and alder thicket that lines the low, flat shores of Oneida Lake just west of the village of Constantia.

During June, the black duck is not so much in evidence although one bird was seen at Phillips Point, and several at Shaw Point, in the Cicero Swamp south of Clay and on Oneida Lake in the vicinity of Long and Wantrý islands. At the latter places, several small flocks of five to eight adult birds were seen while individuals were observed flying to and fro over the lake as dusk came on. The birds always seemed to be more active toward evening, when they flew about freely, while during the daytime they preferred to remain under cover. I believe that the birds which were observed on the lake were mostly males, for the females were still busily engaged in looking after their young in the swamps and woodlands.

Additional evidence of breeding birds was found during the month. On June 18, 1929, in the Cicero Swamp south of Clay I saw a flock of at least twelve small young accompanied by the parent. The youngsters with much flapping of wings pattered across a long narrow pond in the marsh and followed the adult into the cat-tail growth.

On June 22, 1928, an adult and about ten young were seen in a shallow bayou at Shaw Point, the same situation in which I found the family of young in May, 1929. The ducklings were about half-grown. In their alarm they took refuge among the rootlets and branches of water willow that grows in profusion here, while the adult flew away into the woodland but presently returned and called her brood together.

During July the black duck is much in evidence in this region. Flocks and groups of feeding birds of some size appear on Oneida Lake, particularly in the vicinity of Long and Wantrý islands. This tendency to congregate is not so evident until after July 15 when the number of birds on the lake increases very materially; probably young of the year make up a goodly portion of these individuals. On July 9, 1929, Mr. Clifford Green, a resident of the Lower South Bay district, reported that on July 8, he had seen about 100 birds near one of the shoals east of Dunham Island. Toward the close of the month black ducks occur in numbers off the north shore of Frenchman and Dunham islands where they are more or less protected from the strong westerly winds that frequently prevail at this season. The vicinity of Long and Wantrý islands also affords favorable feeding grounds, and loose flocks of twenty to thirty birds are always to be found there during the closing days of the month.

On July 13, 1928, I flushed an adult from a small, muddy, willow-dotted pond near the mouth of Chittenango Creek. Duckweed and other aquatic vegetation was abundant here.

At the Cicero Swamp south of Clay the abundance of the black duck becomes more apparent as the summer wanes, for numerous individuals and small flocks are not uncommon. Considerable activity among the birds is manifest at this season, particularly as evening approaches, and from early dusk until nightfall they can be seen flying in all directions from one part of the

swamp to the other. Their crepuscular and nocturnal tendencies are particularly well marked.

During August black ducks become much more abundant on Oneida Lake, but they are wary and remain well out in the center of the lake and about Long and Wantray islands. However, the ducks ordinarily do not fly far when flushed. Long Island is a favorite feeding and resting place for this species, for toward each end it is broken up into numerous islets between which the water is very shallow, so that many rivulets and miniature bayous are formed. At this season, too, the shallow water immediately to the south of the island supports a considerable growth of sedges so that the birds are more or less protected from the rougher waters of the open lake. The tall canary grass on the island also offers some protection. Flocks of twenty to fifty or more birds are not uncommon here at this season. Mr. Green told me that early on the morning of August 8, 1928, a flock of at least 200 birds passed over him as he cruised along Long Island in his motor boat.

On August 10, 1928, I made the following field note which illustrates very well the status of the black duck on Oneida Lake at this season: "This bird occurs in scattered flocks all over the lake but is particularly abundant in the vicinity of Long Island. Flushed two birds in Big Bay Creek. Saw a flock of twenty in the bay near Brewerton. A flock of fifty was in the water off Long Island, while many groups of two to five birds were to be seen in all parts of the lake. Without doubt this is much the commonest duck of the region."

By August 15 the number of birds on the lake has increased still further. Flocks of thirty to fifty or more are not uncommon at this time. I suspect that many of these have come in from the surrounding smaller lakes and streams where they breed, for the expansive waters of Oneida Lake undoubtedly prove more tempting at this season than the smaller waters in the region. At this season they are seldom in the company of other ducks, probably because there are few other kinds here. However, they do occur occasionally with red-breasted mergansers.

On August 13, 1929, I flushed an adult female at Long Island. She was accompanied by at least one young bird still unable to fly well. These birds had probably moved in from some breeding place along the lake shore or from some creek flowing into the lake for, although the spotted sandpiper and the common tern breed freely on Long Island, I do not believe that the black duck breeds there.

Mr. Herbert Walker, who lives near Fish Creek (at the village of Fish Creek Landing) told me that the black duck breeds in the thickets about the back waters from this creek in this vicinity. A few weeks previous to my visit on August 12, 1929, his small daughter had captured alive a young black duck near one of these thickets. I, too, have seen adult ducks in this thicket but have found no nests or young birds.

Not all the black ducks in the region are attracted to Oneida Lake, in the first half of August, at least, for the birds also become more plentiful in the Cicero Swamp south of Clay, where they continue to fly about and feed in apparently increased numbers. The quiet murky waters of Mud Creek and the



Fig. 159. Bushy tangles and second growth pines on old cleared area bordering wooded tract about two miles north of Cleveland. Habitat of eastern field sparrow and indigo bunting. June 13, 1928.



Fig. 160. Grassy field bordering mixed woods. Big Bay district. June 8, 1928.



Fig. 161. Road through swamp, Big Bay district. June 8, 1928



Fig. 162. West side of Big Bay looking north. July 13, 1928, (Photograph by W. A. Dence).

adjoining pools, all well covered with duckweed, offer abundant food, hiding places and comparative freedom from human disturbance.

From the foregoing account it is apparent that the black duck is an important feature of the Oneida Lake bird fauna, where its general prevalence and abundance cause it to be much sought after by hunters during the open season.

While feeding, black ducks are usually very noisy, the individuals of a flock maintaining a constant quacking. At the same time they are very alert and suspicious. The note of the male is lower than that of the female which is loud and resonant.

When suddenly alarmed these birds rise from the water without difficulty, and with loud quacks warn their fellows as with outstretched necks and rapid wing beat they quickly attain considerable speed. More than once I have thus surprised them at Long Island but seldom did I get nearer to them than forty yards before they took wing. These birds also are good swimmers and fair walkers, although the legs are placed too far back on the body for easy terrestrial locomotion. In diving, too, they are adept.

Concealment is the principal thing required so far as the nesting site of the black duck is concerned. The numerous swamps and tangles in Big Bay, Shaw Point, Fish Creek and Cicero Swamp districts are, therefore, ideal habitats. Pairing usually occurs in March and nest building and egg laying are the principal activities from mid-April to about May 20. The nest is usually placed on the ground, frequently near water, and is composed of weeds, leaves, grass and the like, with a lining of down and feathers. From six to twelve whitish or greenish white eggs make up the usual complement.

"Incubation lasts for twenty-six or twenty-eight days and is performed by the female alone. The males usually desert the females as soon as the eggs are laid and flock by themselves, leaving their mates to hatch the eggs and care for the young." (Bent, 1923, p. 54.) The little groups of birds that were so frequently observed on Oneida Lake in May were probably largely composed of those males that had thus abandoned family cares and responsibilities.

The downy young are precocial and leave the nest a few hours after hatching, although they continue under the protection and guidance of the female for some weeks.

The black duck feeds largely on the surface or dabbles in shallow water where it feeds by "tipping." The waters about Long and Wantry islands and in the Cicero swamp southwest of Clay are just suited to its habits and here I have frequently seen birds with their tails directed skyward as they probed in the mud for food.

Studies of the stomach contents of 390 black ducks, taken from September to February in nineteen states and two Canadian Provinces, are reported upon by Mr. W. L. McAtee of the United States Bureau of Biological Survey (U. S. Dept. Agric. Bull. No. 720, pp. 10-14, 1918). His findings show that about seventy-six per cent of the food of this species consists of vegetable material, of which pondweeds, eelgrass and sedges make up by far the greatest share. Animal material, consisting mainly of mollusks, both bivalves and univalves, crusta-

ceans, insects and fishes made up the remainder or approximately twenty-four per cent of the food.

In an economic way this bird may do some harm by destroying certain small mollusks and the eggs of fishes. However, its destruction of insects and crayfishes is an item in its favor, and its value as game and as a supplementary source of human food must also be taken into consideration.

Size and form of the mallard but darker; sexes similarly colored. General coloration dusky brown, lighter below, the throat and sides of head buffy. Lining of wings white. Speculum or wing-patch rich purple, bordered both before and behind by black and with only a narrow white line behind the black. Bill yellowish green, nail blackish. Tarsi and toes brownish.

Baldpate. *Mareca americana* (Gmelin).

The occurrence of this species is based upon a single observation, so far as my own records are concerned, namely, a male seen on May 6, 1929, in the quiet waters of Oneida Lake just northeast of Nicholson Point near Brewerton. The bird was feeding with a group of about twenty lesser scaup ducks. Although I was some distance from the flock, the white patch on the crown of the baldpate was clearly visible with the aid of a glass. Possibly females or other males of this species were in the group but if so I could not distinguish them.

No doubt this species, too, is more common than my observations would indicate. It is recorded by Eaton (1910, p. 190) as "a fairly common migrant on the shores of Long Island and the marshes and lakes of western New York." It may be expected to occur on Oneida Lake from early March to perhaps the middle of May in spring, and in October and early November in the autumn.

The common name "baldpate" is derived from the fact that the middle of the crown in the male is *white*, not actually bald; the female, however, lacks this mark of distinction and the head in this sex is dingy buff finely streaked and barred with black.

Blue-winged Teal. *Querquedula discors* (Linnaeus).

We have observed the blue-winged teal or summer duck in the Oneida Lake region in May as well as throughout June and July. Although I have no first hand evidence that it breeds here I have observed it under conditions and in situations that point strongly to the possibility, and I have the statements of C. J. Warner and W. Shepard, residents in the vicinity of Cicero Swamp, that it does so.

Of course this bird already had arrived from the south before my observations began, for it puts in its appearance here about April 15. My earliest record is May 1, 1929, when I saw two males and at least as many females in company with two or three wood ducks in the shallow backwater from the lake in the Short Point district; and on May 2, 1929, I saw a pair in the Cicero Swamp one and one-half miles southwest of the village of Clay. This part of the swamp is traversed by Mud Creek and considerable water covers

parts of it all summer. In addition, extensive cat-tail areas and some woodlands occur here so that ideal breeding conditions for this teal are afforded. The district is more or less isolated and during summer is seldom visited by humans.

In addition to the records above mentioned we have the following supplementary notes on its local occurrence:

"May 29, 1928. One male; stagnant backwater of Shaw Bay and within seventy-five yards of Mr. Shaw's dwelling house. Mr. Shaw once told me that he thought the blue-wing bred here.

"June 8, 1928. One male; Phillips Point district; pool of water in heavily wooded swamp near Oneida Lake. This is a likely breeding place.

"June 18, 1929. Two males; Cicero Swamp southwest of Clay; evening; flew from one part of swamp to another.

"July 2, 1928. Two adults; Cicero Swamp southwest of Clay; flying about swamp; too dark to make out sex of birds in flight.

"July 11, 1928. One female; Cicero Swamp southwest of Clay; early this morning saw the bird rise from the swamp west of the Rome, Watertown and Ogdensburg railroad tracks, which traverse the swamp, and wing its way east across the tracks to alight again in another part of the swamp some 200 yards away.

"July 17, 1928. Two males and one female flying over Mud Creek, Cicero Swamp southwest of Clay; no doubt others flew over after it was too dark to identify them with certainty. This bird seems to be present in some numbers and it doubtless breeds here.

"August 13, 1929. A pair flew over Long Island."

While therefore the blue-winged teal apparently breeds sparingly in suitable situations in the Oneida Lake region most of the birds pass north early in May, not to return again for four months. The species is reported (Eaton, 1910, p. 194) to be "more common in the lake region of western New York than on Long Island and is decidedly more abundant in the fall than in the spring in all parts of the State."

During migration the blue-winged teal often occurs in flocks of some size. The flight is rapid—the bird is said to be able to attain a speed of two miles a minute—and direct, yet when alighting it drops quickly into the marsh with little diminution in its speed immediately before descending.

The nest of the bird is said to be placed on dry ground near fresh water; it is well concealed and is composed of dry grass lined with down. Six to twelve eggs are usually deposited. Eaton (*loc. cit.*, p. 195) records the species as breeding in Oswego County, but gives no dates. Saunders (1926, p. 388) also records its presence during summer in the Montezuma marshes.

This bird is a favorite among local gunners and in autumn is much sought after; at that season it is said to be fairly common in the region. By late October the blue-wings have departed for the South.

The small size and grayish blue middle and lesser wing-coverts will serve to distinguish this species. In addition, the male has a large crescent-shaped patch of white in front of the eye. It is conspicuous even in flight. The colloquial name "white-faced teal" is often applied to the bird on this account.

Wood Duck. *Aix sponsa* (Linnaeus).

Although at one time a common summer resident throughout New York State, the wood duck has become so much depleted in numbers through continued slaughter that it now nests only in localities that offer unusual advantages.

While my evidence on this point is largely circumstantial, I believe that the Oneida Lake region is one of the localities in which the species breeds sparingly.

In the course of my 1928 season's field work I saw the wood duck on only one occasion, the late afternoon of July 17, in the great cat-tail marsh, a part of the Cicero Swamp, one and one-half miles southwest of the village of Clay. Here about dusk I saw a single male, accompanied by two other birds of possibly the same species, flying over Mud Creek which flows through the swamp. Judging from this late date and from the reports of trappers and local residents, the species nests not only here but in suitable situations along the shores of Oneida Lake itself. Such places as the Shaw and Short Point districts, where almost impenetrable wooded swamps and low lands border the lake, offer the conditions most desired by this duck. Messrs. Warner and Shepard told me that the bird sometimes nests in the Cicero Swamp southwest of Clay, and Mr. Shaw, that it nests in the wooded areas about Shaw Bay.

On May 1, 1929, I saw a pair of wood ducks in company with four or five blue-winged teal in the wooded backwaters of Oneida Lake, in the Short Point district, and five days later I again saw the species here.

Dr. J. F. Mueller of the staff of Forest Zoology, N. Y. State College of Forestry, reported several birds in the vicinity of Big Bay Creek on May 17, 1930.

While the above constitute my only records for the wood duck in the Oneida Lake region, I suspect that it is somewhat more common than these findings indicate. Owing to the difficulties encountered in penetrating the flooded woodlands about low-lying lake shores in certain sections the presence of the wood duck here probably was overlooked.

In spring this beautiful duck may be expected in the Oneida Lake region any time after mid-March, and while the species may occur sparingly as a summer resident, it is likely to be more common again during the autumnal movement in September. Ordinarily the southward migration is over by the close of November.

Among American wild fowl the wood duck, or summer duck as it is sometimes called, is generally conceded the place of honor so far as beauty is concerned. During the breeding season the male in particular is conspicuously colored and at this period it is said to make much display of this plumage before the female. The latter, while lacking the brilliant coloration of the male, presents a richer combination of color than do most female ducks.

The wood duck usually occurs in pairs or in small flocks. "It is conspicuous for the swiftness, ease and elegance of its flight. It can pass through woods and among the branches of trees with as much facility as the wild pigeon. While flying it is rarely ever heard to utter any cry." (Baird, Brewer and Ridgway. The Birds of North America, Vol. 2, 1884, p. 14. Water Birds.)

The wood duck is more or less omnivorous in its food habits, taking not only aquatic animals and plants but also wild grapes and acorns and even cultivated wheat and corn.

While most ducks nest upon the ground this species nests in hollow trees or stumps. The entrance to the nest cavity may be from a few feet to as much as fifty feet above the ground. The usual complement of eggs is from eight to fourteen. It is said that a bird will return to the same nesting site year after year.

Male in breeding plumage with head and elongated crest, rich metallic green; chin and throat white; a line from bill over eye, a line along side of crest and other lines in the crest white; crescents in front of wing white and black; speculum dark blue. Breast purplish chestnut marked with white; rest of under parts white. Female duller colored, with conspicuous white eye-ring and stripe behind the eye.

Greater Scaup Duck. *Nyroca marila* (Linnaeus).

While I cannot with certainty affirm that I have seen this bird in the Oneida Lake region, it is altogether likely that some of my records for the lesser scaup duck may refer to the larger form.

The scaup ducks or blue-bills are among the commonest birds on Oneida Lake during early May. Here as elsewhere in the United States the present species is probably not so plentiful as the lesser scaup. However, its habit of associating with the lesser scaup and the difficulty of separating the two species in the field may account for the lack of data on the greater scaup duck.

Some observers claim to be able to distinguish the two scaups readily in the field, but I must confess to my inability to do so under field conditions unless both species are represented in a flock and the individuals can be compared and contrasted while at close range. The black head, slaty blue bill, white belly and upper parts together with the white speculum will distinguish the two male scaup ducks from all other ducks. From each other the males of the two species may be distinguished by the larger size of the present one—it averages two inches larger than the lesser scaup—and by the metallic greenish reflections on the side of the head instead of the purplish ones possessed by the lesser scaup. The females of both species of scaups have whitish feathers about the base of the bill, whitish belly and white speculum; the females of the two species are scarcely distinguishable except for size, the greater scaup averaging about two inches longer than the lesser.

The greater scaup duck seems to be commoner along the coast than on the inland waters of the State. It may be expected in the Oneida Lake region about mid-March, and departs for the North about May 1. In autumn it is likely to be seen between October 1 and late November.

Lesser Scaup Duck. *Nyroca affinis* (Eyton).

Since I can not say with certainty that I have seen the larger form in the Oneida Lake region I am including all my observational data under the present heading.

In New York State the lesser scaup duck has a wide distribution during migration, the first arrivals appearing about March 15 and the last moving north-

ward about June 1. The principal breeding range is in the interior of North America from North Dakota and Montana north to the Yukon Valley and Mackenzie River. Fall arrivals appear in New York State about October 1 and are likely to be found well into December. They are said to occur occasionally in winter in the warm parts of the State.

This duck is also found in numbers on Oneida Lake where it is said to arrive about March 15. My latest spring date is May 21, 1929, when I saw two birds in Bernhard Bay. I have not seen the species here in June, but on July 19, 1928, I saw a flock of five males and four females swimming and feeding a short distance off Wantry Island. This is too early a date for the birds to have returned from the northern breeding ground, and I do not believe that the species breeds in Oneida Lake. Probably these birds were non-breeding individuals.

The lesser scaup or little blue-bill occurs on almost every part of Oneida Lake, but feeding groups are particularly common during the early days of May in such sheltered places as Lower South Bay, Messenger Bay, Maple Bay, Constantia Bay and Bernhard Bay. It is a very social duck and ordinarily flocks of three to a dozen individuals are seen not far off shore. The largest flock I saw near shore comprised forty birds; both males and females were represented in this group which was feeding a short distance off Verona Beach on May 7, 1928. As I approached the ducks, the males appeared very solicitous and before moving out into the lake and away from the intruder they swam about the females, rounding them up, so-to-speak, and escorting them into deeper water. On one occasion in early May I saw a number of these birds feeding with American golden-eyes in Maple Bay. Farther out on the lake, larger flocks can be seen almost any day during the first half of May. They spend part of the time with the head tucked under the wing, apparently sleeping. A part of the time is spent diving for food, which consists mainly of mollusks, crustaceans, aquatic insects and vegetation. A considerable part of their time is taken up also in preening and caring for their plumage. I have often seen them partly elevate the body from the water as they swam and, while apparently treading water or standing on it, flap the wings rapidly and stretch the body, then settle down in evident contentment.

While these birds are wary and difficult to approach on the open waters of the lake they appear to be quite unconcerned by the ordinary routine of the cottagers on the shore near their feeding places, and by the heavy automobile traffic on the highways which, at some points, course along the immediate lake shore. Scaups are very often seen on the quiet waters of the lake near the trolley station at Lower South Bay where, at times, considerable crowds of people congregate. The attendant noise seems in no way to modify the activities of the ducks.

Local hunters call this duck the blue-bill, but it is not held in high repute as a table bird. However, in spite of its reputation from a gastronomic standpoint I understand that considerable numbers are shot on the lake during the open season. Notwithstanding its general depletion each season the species seems to be maintaining itself surprisingly well.



Fig. 163. Three Mile Creek, one-half mile from shore line, east side of Big Bay. Arrow arum and swamp loosestrife afford abundant cover for many species of birds. August 10, 1928.



Fig. 164. Big Bay swamp. Habitat of eastern red-winged blackbirds, bronzed grackles, tree swallows, eastern green herons and great blue herons. July 26, 1929.



Fig. 165. Cicero Swamp one and one-half miles southwest of Clay. Eastern green heron perched in tree. August 7, 1928.



Fig. 166. Arrow arum, marsh grass and ferns in Cicero Swamp one and one-half miles southwest of Clay. Habitat of Virginia rail and Florida gallinule. June 18, 1929.

American Golden-eye. *Glaucionetta clangula americana* (Bonaparte).

During the course of my observations at Oneida Lake in the season of 1928, I was never able to distinguish this bird with certainty in life, but on May 12, I came upon the decaying carcass of a female of the species, thus indicating that it had been alive here not more than perhaps two weeks previously. The remains were lying about 200 yards from the lake shore at the edge of a small creek that flows into Froher Bay, two miles northwest of Bridgeport. Probably the bird had been wounded by a gunner or had met with an accident. The feathers of the head, upper neck, back, wings and tail were practically intact so that identification was made certain.

On May 3, 1929, I saw a flock of about twenty birds, mostly males, on the quiet waters of Maple Bay about one hundred yards off shore. They were accompanied by a few scaups. Five days later at the same place I again saw several golden-eyes feeding with scaups and a pair of red-breasted mergansers. A horned grebe also was a member of the group.

Hunters about the lake tell me that "whistlers," as these birds are usually called, are fairly common here, particularly in autumn. The birds arrive from the northern breeding grounds in November and sometimes do not leave for the South until the lake is frozen over. They are hardy birds and often remain on open waters in the State throughout the winter. Sadler (1926, p. 4) gives the earliest date of spring arrival in the Syracuse district as March 7, 1925, but reports a flock of nineteen on Onondaga Lake, January 19, 1924.

Concerning the occurrence of the golden-eye in the State, Eaton (1910, p. 209) says: "Mr. H. C. Higgins of Cincinnati, N. Y., reports a young male taken in Cortland county, July 15, 1899. Mr. Barnum, in his list of the birds of Onondaga county, mentions one case of its breeding there, but otherwise it is not known to nest in the State outside of the Adirondack region, where it has been recorded as a summer resident and as breeding by Dr. Merriam, and also by Ralph and Bagg, who found young birds in Hamilton county during the month of June, 1878 and in 1879."

The peculiar whistling sound made by this bird and which is responsible for one of its numerous common names, is produced by the rapidly vibrating wings during flight. Other common names more or less suggestive of some characteristic of the bird are brass-eye, great-head, garrot and whistle-wing.

Migrating golden-eyes ordinarily travel in small flocks, and their flight is swift and powerful. They are said (Bent, 1925, p. 8) to be very active on the wing while on their breeding grounds among the lakes and streams of eastern Canada. They are also skillful divers, sometimes using the feet unaided, with wings closely appressed to the sides of the body, sometimes using the wings to assist.

The golden-eye feeds largely on clams and other shellfish which it secures by diving. In addition, it is reported to feed upon aquatic insects, grasses and roots. The stomach of a specimen taken in Massachusetts contained "seeds of pondweed, water-lily, bayberry, and bur-reed, buds and roots of wild celery, and bits of water boatmen, and dragonfly nymphs." (Phillips, 1911, p. 200.)

This duck breeds in well watered, wooded country. Its nest of feathers is built in a hollow tree at a height of six to sixty feet. It may be on a level with the entrance hole or several feet below it. From five or six to eight to twelve greenish eggs make up the usual clutch, which is deposited in the latter part of May. Incubation is performed by the female and continues for a period of about twenty days. The young birds remain in the nest for a day or two after hatching, then climb to the entrance hole where, after some encouragement from the female, they drop into the water below.

This duck is not particularly popular among gunners for it does not come well to decoys and its flesh lacks the flavor that characterizes many other species of ducks.

The moderate size, pied appearance, stout build, yellow eye and the whistling sound produced by the wing are good field characters. Male: Head and throat dark shining green; a circular white patch on side of head at base of bill. Under parts, neck and exposed parts of wing covers white; rest of plumage black. Female: Head and throat brownish; upper breast, back and sides grayish; speculum, lower breast and belly white.

Buffle-head. *Charitonetta albeola* (Linnaeus).

I have seen this little duck on only two occasions in the Oneida Lake region. On May 8, 1929, a male and a female were sighted about fifty yards off shore in Delmarter Bay. The birds were not accompanied by any other species and were swimming about quietly and unconcernedly. A week later a pair was seen in the quiet waters of Constantia Bay. Sadler (1926, p. 4) records the species at "Brewerton in North Bay and at Constantia," and Dr. C. E. Johnson reports two buffle-heads in company with twenty-eight lesser scaup ducks on May 2, 1929, at Constantia Bay.

It seems altogether likely that these few records are no criterion of the status of the species in this region, for I believe that most of the birds have departed for their northern breeding ground by the close of the first week in May. This is borne out by the statements of local hunters, all of whom are familiar with the butterball, or butterbox, and by conversation with Mr. Krantz, a gentleman who has lived in this vicinity many years. He tells me that he has frequently seen this bird on the lake in front of his cottage at Lower South Bay. The sum of available evidence indicates that the buffle-head is a fairly common migrant in this region, the migratory movement being most marked between April 1 and May 1.

During the breeding season the buffle-head is found mostly in Canada and extreme northern United States.

This duck is most likely to be met with in pairs or small flocks, particularly in spring when it frequents quiet parts of the lake and no doubt also nearby ponds and creeks. It possesses extraordinary ability as a diver, being, in this capacity, little less expert than the grebes and loons. It is shy and depends for safety principally upon its agility in under-water progression, in which efforts it is said to use both wings and feet. It is said, also, to dive at the flash of a gun and on this account is difficult to shoot.

Observers state that small fish form one of the principal articles of diet of the buffle-head; these it secures by means of its diving.

Owing to the thick layer of fat which covers the body the species has acquired the names of butterball and butterbox among gunners. While they do not prize its flesh highly—they say that it has a “fishy flavor”—they do enjoy trying their marksmanship on this lively and handsome duck. It flies swiftly, with rapid wing beat, and usually close to the water.

The buffle-head is a distinctly marked duck not to be confused with any other member of the group, except possibly the male hooded merganser; but the latter has a slender, serrate bill, and the lower neck is not white all around, and the head bears a large, semicircular crest resembling somewhat the fluffy head dress of the buffle-head. The female buffle-head is a small, stocky, inconspicuous bird with a small white spot on the side of the head and a white patch on the secondaries.

Ruddy Duck. *Erismatura jamaicensis rubida* (Wilson).

On May 2, 1929, in the quiet waters of Lower South Bay, just west of the Syracuse Yacht and Country Club, I discovered what I believe was a female of this species swimming about with a flock of male and female scaup ducks. The small size, broad bill, short neck and slightly whitish cheeks along with the short tail set it off from the female scaup ducks and although I was perhaps 100 yards from the birds these field characters were plainly evident with the aid of the glass. A week later I again saw a female ruddy duck feeding with a group of scaups at the same place. These are my only records of the species for the region.

The ruddy duck seems to be a more or less irregular migrant on the inland waters and the seacoast of the State. Its breeding range extends over a vast territory from Great Slave Lake south to Guatemala, and it has been recorded as breeding in New York State on the marshes of the Seneca River and possibly also on a pond near Rochester (Eaton, 1910, p. 225). However, it ordinarily does not nest within our boundaries.

I doubt whether this bird breeds on or about Oneida Lake, but it is likely to occur here during the migratory season from late March to perhaps May 10, and again from late September through the month of October. Possibly careful observations over a period of years would reveal its more frequent occurrence than my notes indicate.

In some respects the habits of this chunky little bird resemble those of the grebes. When attempting to rise from the surface of the water in flight it patters along for some distance before it can attain sufficient momentum to rise into the air. When under way it flies swiftly and at no great height. When swimming the body rides deep in the water and the tail is held in a more or less erect position. The bird is able to sink beneath the surface without diving. In this art the ruddy duck is exceedingly adept and it will often attempt to escape danger in this manner rather than take flight.

The ruddy duck usually conceals its nest well among tall rushes and flags in marshy places. In proportion to the size of the bird the eggs, which vary in

number from five to fifteen, are very large. In the central and eastern part of its range the nesting period is principally in June. Incubation is performed by the female; the time required is "probably not far from thirty days" (Bent, 1925, p. 155). The young are said to be very precocial.

The food of the ruddy duck is reported by various investigators to consist of seeds, roots and stems of aquatic and semi-aquatic plants; snails and insects also make up a part of its diet in fresh waters, while along the seacoast small crabs and other marine forms are taken. Stomachs containing seeds of bur-reed, pondweed, bulrush and *Naias*, and buds and fragments of wild celery together with chironomid and hydrophilid larvae are reported by Phillips (1911, p. 200).

The ruddy duck is prized as a table bird.

Hooded Merganser. *Lophodytes cucullatus* (Linnaeus).

Although the hooded merganser has been recorded as nesting at several points in the State, including the Catskill and Adirondack regions, it is best known as a migrant. Since it usually arrives from the South in March and proceeds north in April it is not surprising that I have but a single record for the species during the period of my observations. On May 1, 1928, two males were observed on the quiet waters of Lower South Bay, between the mainland and Frenchman Island. Sadler (1926, p. 3) records the species from North Bay at Brewerton, April 24, 1922.

The hooded merganser apparently prefers quiet ponds and lakes which are too small to attract other related species, and partly on this account it is not so likely to occur on Oneida Lake in any numbers. However, I suspect that it may be seen on the lake more commonly during April and possibly also in October and November while on its southward journey.

This is the smallest of our mergansers and may be distinguished by its large circular crest which in the male is white bordered with black; in the female it is smaller and grayish brown tinged with cinnamon.

American Merganser. *Mergus merganser americanus* Cassin.

On the waters of Oneida Lake the American merganser occurs fairly commonly through the month of May. My latest seasonal record is June 6, 1929, when I observed three males and two females feeding and swimming slowly along near the lake shore off the village of Cleveland. The species arrives in spring as soon as open water appears. The considerable number of suitable nesting habitats little frequented by humans and the occurrence of the species in the region in June suggest the possibility that some individuals nest here. Usually these birds have departed for the North before the end of May. Returning birds are likely to be found in October. This species has been recorded by Eaton (1910, p. 178) as nesting near Buffalo, Montezuma and Little Sodus Bay, and sparingly in the Adirondacks.

I have usually found this bird in pairs or in small flocks made up of both males and females. The largest group I have seen comprised thirteen individuals. Lower South Bay, mouth of Chittenango Creek and North Bay are additional points where I have observed the species at Oneida Lake. Dr. C. E. Johnson

records several males at the mouth of Chittenango Creek on April 12, 1927. On May 15, 1928, at Hitchcock Point, I found the carcass of a male that had been shot a short time previously.

Sometimes called the handsomest of the swimming birds, the American merganser or sawbill as it is usually called locally, is not only an excellent swimmer but also an expert diver. It feeds regularly on fish which it secures readily by reason of its extraordinary ability in the water. The long, cylindrical bill, sharp-edged, strongly hooked at the tip and furnished along its cutting edge with a series of strong, sharply-pointed and posteriorly directed "teeth" affords an excellent instrument for aiding in the capture of its active, struggling prey. Progression under water is effected solely by means of the feet. The birds, once under way, are strong fliers but rise from the water rather slowly, for they are compelled to patter along on the surface with their feet for some distance before they acquire sufficient momentum to take to the air. I have found this merganser to be wary, and if surprised while feeding near shore it moves quickly to more open water which it gains by alternately swimming and diving—unless too closely pressed, when it takes to flight.

It is said that the nest of this bird is placed in a hollow tree near water and from ten to fifteen feet from the ground. The young are extremely active and precocial and upon leaving the nest are already adept as swimmers and divers.

A considerable number of colloquial names, most of which refer to some habit or characteristic of the bird, have been given this species at one time or another. Unfortunately all of these names are applied indiscriminately to both the American and the red-breasted merganser, and sometimes to the hooded merganser, so are scarcely definitive. The names most frequently heard are mergansy, sawbill, fish duck, sheldrake, goosander, wheezer and tweezer.

The only other bird with which the American merganser can be confused is the red-breasted species. It may be distinguished from this species by its slightly larger size, head crest with a single point and (in the male) by the lack of the reddish-brown collar on the lower neck. At a little distance the males appear black and white.

Red-breasted Merganser.

Mergus serrator Linnaeus.

The red-breasted merganser apparently occurs chiefly as a migrant in the Oneida Lake region, where it may be expected to arrive late in March from its winter range along the eastern coast of the United States. It is said by Eaton (1910, p. 180) to nest in the Adirondacks, but in the East, at least, this is near the southern edge of its breeding range and most of the birds nest farther north. However, the occurrence of this merganser on Oneida Lake throughout the summer lends some weight to the belief that it nests in this territory. Ordinarily, birds returning from the northern breeding grounds reach this section in September and October.

At no time have I found the red-breasted merganser of frequent occurrence on Oneida Lake, although I believe that it is commoner than my comparatively few records indicate; for during the summer, at least, it keeps largely to the

open parts of the lake and visits freely the waters surrounding Long and Wantry islands. At all times it is more common in the region than its near relative the American merganser.

On account of the uncertainty of the local status of this merganser I venture to include here all the dates upon which I noted the bird during my two seasons' work in this region, together with appended brief notes.

"May 1, 1928. Several individuals feeding in the shallow waters of Lower South Bay, near shore and in company with two hooded mergansers and several American mergansers; very shy.

"July 24, 1928. Long Island. This evening about 7:30 o'clock I discovered three males and three females feeding with a flock of black ducks on the water along the north side of Long Island. Perhaps other mergansers were in this group but if so I was unable to distinguish them in the darkness. The red-breasted mergansers were very wary and took flight as I walked about the island while most of the ducks remained on the water, merely swimming a little farther out on the lake. This is the first time that I have observed this species since May 1.

"August 8, 1928. Saw one female feeding off the north end of Wantry Island about 8:20 A. M. Later in the morning, another bird flew over Long Island while I was there. This merganser seems to associate freely with the loose flocks of black ducks that feed in this vicinity.

"May 8, 1929. A male and female feeding with the scaups and golden-eyes at Maple Bay. Later in the morning, off Shackelton Point, I saw a group of seventeen birds; both males and females were represented.

"May 11, 1929. A pair in the quiet backwaters of Oneida Lake near the mouth of Chittenango Creek.

"May 12, 1929. A female off shore at Lower South Bay.

"June 19, 1929. A flock of sixteen birds arose noisily from the water off the north side of Long Island as I approached it at 6:00 P. M. They took to the air with much flapping of wings, pattering along on the water for some distance before they gained sufficient momentum to fly. Once under way they made off in a direct, swift flight.

"July 9, 1929. Several males and females in the water off the north side of Long Island took flight at my approach, pattering along for several yards before they finally left the water."

Dr. C. E. Johnson reports several individuals (seven to ten) on Oneida Lake, near the mouth of Chittenango Creek, on May 9, 1928.

During both seasons, therefore, the bird was observed sparingly throughout the summer months and although no nests or young birds were discovered it seems not unlikely that an occasional pair may nest here. Eaton (1910, sec. 1, pt. 2), on the authority of Ralph and Bagg, lists this bird as breeding in Oneida County and (*loc. cit.*, sec. 1, pt. 11) indicates also that it breeds in Oswego County. Neither dates nor other data are submitted.

The occurrence of flocks of red-breasted mergansers about Long Island illustrates one of the habits of this fish-eating bird, namely that of feeding in



Fig. 167. Cat-tail marsh, pond and old muskrat house in Cicero Swamp one and one-half miles southwest of Clay. August 9, 1928.



Fig. 168. Mud Creek in Cicero Swamp one and one-half miles southwest of Clay. July 6, 1928.



Fig. 169. Mud Creek in Cicero Swamp one and one-half miles southwest of Clay. Habitat of Florida gallinule, eastern least bittern, long-billed marsh wren and swamp sparrow. July 6, 1928.



Fig. 170. Wantry Island. July 24, 1928.

groups and advancing slowly on a wide front, diving and fishing as they move along.

As a swimmer and diver this merganser is an expert. In diving, the feet alone are ordinarily used in propulsion under water, but if hard pressed the wings are sometimes brought into service. On Douglas Lake in northern Michigan, I have often pursued swimming birds in a motor boat. I should say that a swimming speed of at least four miles an hour was maintained while these pursuits were on. When hard pressed the birds dived and swam under water for some distance to reappear in quite an unexpected quarter and at a point remote from their pursuer. When alarmed they often swam with the body riding below the surface of the water, only the head and upper neck projecting from it. Even the ducklings are exceedingly active in the water.

As a walker this merganser, as well as its relatives, is very awkward, for its short legs are set well back on the body, and its large webbed feet are not at all fitted for this type of progression.

The nest of the red-breasted merganser is built on the ground, usually near the borders of streams or fresh-water ponds or lakes. It consists of a more or less concealed concavity lined with feathers. From eight to ten buffy eggs make up the usual clutch; June and July are the months in which eggs are most likely to be found. "Incubation lasts from twenty-six to twenty-eight days and is performed entirely by the female; the drakes are rarely seen in the neighborhood during this period." (Bent, 1923, p. 16.) The young are precocial and can move about within a few hours after hatching. Concerning some young mergansers that were hatched in captivity under a brood hen, Strong (1912, p. 483) says: "The two hatched on July 11, were seen in the late afternoon of that day sitting on top of the hen's back, a location they seemed to attain with little trouble. . . . On the next day, the little birds were still more active, . . . They were also able to move rapidly over the ground, though apparently not yet able to stand on their feet. Locomotion was accomplished by a peculiar wriggling movement of the whole body prostrate on the ground."

Under natural conditions the members of a family remain together until the young are well developed. During this period they are attended by the adult.

The food of this merganser consists mainly of fish. In their capture the aquatic ability of the bird together with the long serrate bill are valuable aids. In addition to fish this merganser feeds upon crustaceans and mollusks, and the young are said (Bent, *loc. cit.*, p. 16) to feed upon "small fish, water insects and larvae, worms, crustaceans, and sometimes frogs."

On account of its fishy flavor, the red-breasted merganser is not in demand as a game bird.

The long neck, head and red bill, in flight held in a straight line from the flattened body, and the white-marked wing are good field characters. In addition, the reddish brown breast of the adult male and the black head with long, thin double crest are helpful identification marks. The female has the head and neck cinnamon brown, the throat with less white than in the American merganser and the back browner than in that species.

ORDER FALCONIFORMES

KITES, HAWKS AND ALLIES: FAMILY ACCIPITRIDAE

Sharp-shinned Hawk. *Accipiter velox velox* (Wilson).

Although the sharp-shinned hawk occurs in most parts of the State as a common summer resident, particularly in wooded districts, I did not find it to be at all common in the Oneida Lake region. Even in the woodlands about the lake I observed it only a few times during May. Neither this nor any other hawk except the marsh hawk seems to occur commonly in the region. The paucity of members of the raptorial group of birds here is rather surprising. Possibly the sharp-shin is commoner than my records indicate.

On July 2, I saw a single bird flying over the Cicero Swamp one and one-half miles southwest of Clay; it was carrying a small bird in its talons and was closely pursued by a half-dozen angry red-winged blackbirds. Perhaps one of their number had fallen a victim to the sharp-shin.

Dr. C. E. Johnson records a single example at the east end of Oneida Lake on August 21, 1929, and another from the vicinity of Mud Creek in the Euclid district, a mile south of Oak Orchard, on August 23, 1928.

In New York, this little hawk is commonest during migrations, late March to late April and late September to early November. It is generally common and widely distributed as a summer resident and a few individuals may winter over in the warmer parts of the State. It is an alert and very active hawk, usually flying swiftly and low down through woodland and undergrowth, charging upon its victims as they attempt to escape.

The nest of the sharp-shinned hawk is composed of sticks, and most frequently rests in an evergreen tree in or near the woods. Eggs are usually deposited in May.

The usual and preferred type of food of this hawk is small birds such as English sparrows, song sparrows, robins, vireos, thrushes and other passerine species, and occasionally some of the larger forms. "Of 159 stomachs examined six contained poultry or game birds; ninety-nine, other birds; six, mice; five insects; and fifty-two were empty." (Fisher, 1892, p. 37.)

Although it is not plentiful here, this aggressive and destructive hawk is generally considered to be a menace to beneficial birds, but unfortunately other and larger but less injurious species of hawks often pay the extreme penalty for damage that actually has been committed by the sharp-shin.

Its small size—not much larger than that of a robin—short, rounded wings and long tail, squarish at the end, will aid in identifying this species in the field. In addition, its peculiar manner of flight in which a series of rapid wing-beats is alternated with a gliding movement, is a helpful field character although when the hawk is in full pursuit of quarry it propels itself solely by continuous wing-beats.

Cooper's Hawk. *Accipiter cooperi* (Bonaparte).

This moderate-sized, active and destructive hawk seems to be only a fairly common summer resident in the Oneida Lake region. I have seen examples in the field in the Hitchcock Point, Lower South Bay, Big Bay and Cleveland

districts. This suggests that it is likely to be met with almost anywhere in the region but particularly in the wilder and more heavily wooded parts. I have usually seen it in more or less open but bushy areas at the edge of woodland.

The gamekeeper at the F. C. Soule estate maintains constantly a number of steel traps set on poles about eight feet high in the more open, hilly portions of the estate grounds. Not infrequently hawks are taken in these traps and on June 21 I saw the carcass of a Cooper's hawk that had been trapped here the day previously.

Dr. C. E. Johnson records a single individual from the vicinity of Fish Creek Landing on August 21, 1929.

This hawk is exceedingly active and alert on the wing. On August 10, near Little Bay Creek in the Big Bay swamp I saw one of these hawks perched in a dead tree. Within a few seconds it had darted into the dense foliage a short distance away and a moment later a struggle in the bushes and a splashing in the water indicated that the hawk had struck its prey.

In New York State, Cooper's hawk appears most commonly during its spring movement in March and April and again in fall during September and October but it is usually in the more heavily forested sections that it is seen during the summer. In the Oneida Lake region it is exceeded in numbers by the marsh hawk and red-shouldered hawk and possibly also by the sparrow hawk.

The Cooper's hawk lays its three to five eggs in late April or in May, in a nest sometimes built by the breeding pair, sometimes in a more or less remodeled one of a crow or some other species of hawk.

The term chicken hawk is properly applicable to this species; not only is it destructive to domesticated birds of various kinds but to wild birds as well. Practically all of the stomachs examined by the United States Biological Survey, that have contained anything, have held remains of poultry, game or other birds: "Of 133 stomachs examined, thirty-four contained poultry or game birds; fifty-two, other birds; eleven, mammals; one, a frog; three, lizards; two, insects; and thirty-nine were empty." (Fisher, 1893, p. 43.)

Owing to its larger size this bird exacts a greater toll among the feathered tribe than does the sharp-shin, and while it compensates in a measure by taking some insects, it scarcely can be considered a desirable bird so far as man's interests are concerned.

Not only does the Cooper's hawk resemble the sharp-shinned hawk in habits but also in coloration. However, it averages about five inches longer than the sharp-shin, and the tail is decidedly rounded at the tip, not square as in the smaller species. In addition, adults of *cooperi* have the crown blackish.

Eastern Red-tailed Hawk. *Buteo borealis borealis* (Gmelin).

The eastern red-tailed hawk, commonly although improperly called "hen hawk" and "chicken hawk," appears to be an uncommon summer resident in the region, for I saw it in the field only once in the 1928 season. On June 11, a bird in adult plumage—the bright rufous tail and subterminal black band were plainly evident—was circling high above the woods on the west side of Chitten-

ango Creek, near its mouth. This low, wooded district is a probable nesting place but I saw no evidence of it.

At the hunters' cabin on the F. C. Soule estate near Cleveland, is a mounted red-tail in immature plumage. The specimen was taken on the estate grounds within the past few years.

I have no record of the local occurrence of the red-tail for the 1929 season.

Dr. C. E. Johnson reports one individual from the Fish Creek Landing district on August 21, 1929.

This hawk is said to be generally distributed in New York and to breed in all parts of the State (Eaton, 1914, p. 81), but it certainly is of infrequent occurrence in the Oneida Lake region. It is a well known fact that the numbers of some of our large predacious and other birds have become much depleted in recent years, and I have no doubt that this species has suffered in the same respect. While its reduction here may be local only, data from other parts of the country point to such a condition as general throughout its range.

Occasionally the red-tail winters in the State, but most of its kind spend the cold months farther south. The northward movement begins in late February, reaching its height in March and terminating in late April. Sadler (1926, p. 8) gives February 20 as the earliest date for the Syracuse region and says further: "An immature dead bird was brought to me for identification. It had been shot by a farmer near Baldwinsville on November 2, 1920." In October most of the birds again go south.

This large hawk frequents low woodland as well as more open and hilly country, and I was disappointed in not finding it in the latter type of habitat north of Cleveland and Jewell. The territory south of Bridgeport and Lakeport also offers certain attractive features for the bird, mainly in the way of tall lookout trees and open country.

Most frequently the red-tailed hawk is to be seen gracefully soaring in wide circles over its breeding ground or hunting domain. If the day is clear, the red tail of the mature bird offers a conspicuous identification mark. Another place to look for this hawk is in the top of a dead tree at the edge of woodland or in open fields. Possibly, also, it may be observed coursing low over fields and pastures. When soaring, the "long drawn squealing whistle, 'kee-aahrr-r-r'" will draw attention to the bird.

The bulky nest of the red-tail is usually placed well up in a tall tree, and the eggs, two to four in number, are laid in April.

Although this powerful hawk does sometimes visit the poultry yard, a comparatively small proportion of its food is made up of domesticated birds. Fisher (1893, p. 62) says: "Of 562 stomachs examined, 54 contained poultry or game birds; 51, other birds; 278, mice; 131, other mammals; 37, batrachians or reptiles; 47, insects; 8, crawfish; 1, centipeds; 13, offal; and 89 were empty."

The major portion of the food of this bird consists of field mice and other noxious rodents, so that its beneficial qualities outweigh the harmful.

Northern Red-shouldered Hawk. *Buteo lineatus lineatus* (Gmelin).

Of the larger hawks that occur in the Oneida Lake region, this species seems to be the one most frequently seen, although by no means can it be

considered "common." It is oftener heard than seen and its sharp "*kec-you, kee-you,*" is occasionally heard in the forested districts during the first two or three weeks of May, and at more or less frequent intervals during the summer.

The red-shouldered hawk is a permanent resident in most parts of central and western New York, but I suspect that it is seldom found in the Oneida Lake region in winter. Here it is a summer resident, arriving from farther south shortly after March 15. It is more commonly found in or about forests and its selection of such a habitat is probably an important factor in its survival.

Late in May, 1928, I saw at the Vandercamp woods north of Cleveland, the remains of one that had been recently taken in a spring trap set on top of a post in a partly cleared area near woodland.

On June 25, 1929, in the hemlock-maple woods about two miles southeast of the village of Oneida Lake, I heard an adult red-shouldered hawk calling vigorously. Upon investigation, I found that three young of the year, able to fly well, were concealed among the hemlock trees, but they, along with the adult, took flight at my approach. These young birds were probably reared in the immediate vicinity. The extensive wooded sections here are suggestive of the conditions on the north side of the lake in the Cleveland and Constantia districts where I found this species most frequently.

The Parker woods south of Lakeport is another locality in which I found this hawk. On July 11, 1929, while exploring this wooded tract, I came upon a single individual perched in a hemlock tree, uttering its characteristic shrill cry in an effort to frighten away two or three northern flickers and as many crows that were tormenting it. The smaller birds flew about the hawk, calling loudly, and at intervals swooped down upon it from above to strike its head or body a blow that could be heard some yards away. When I drew nearer the hawk flew away, with the flickers in its train pecking away at it unmercifully.

We have also seen the red-shouldered hawk in heavy mixed woods a mile north of Thompson Corners, and in the district west of Constantia.

The nest is a bulky structure placed high up in the fork of a deciduous tree. The bird does not often choose an evergreen, although Sadler (1926, p. 8) reports a nest "thirty-five feet up in a crotch of a hemlock." Nest-building occurs in late March; the eggs may be laid almost any time between April 1 and May 15. During the breeding season this hawk is noisy. Its loud and oft-repeated notes are then not infrequently heard in the territory on the north side of Oneida Lake.

The food of the red-shouldered hawk consists principally of frogs, toads, salamanders, snakes, lizards, crayfishes, snails and the larger insects, together with several kinds of mice and other rodents. There is no doubt that these hawks do occasionally take smaller native birds, and even an occasional ring-necked pheasant if opportunity offers. However, this type of damage is usually perpetrated only by a few individuals in a locality, so that it is not fair to condemn the entire species. "The Red-Shouldered Hawk has such a good record

that individuals should not be killed except on the most convincing evidence of perverted behavior." (McAtee, 1926, p. 26.)

This hawk, along with most if not all others, serves as a target for gunners in this territory as in many other localities. No serious attempt is made to discriminate between the harmful and neutral or beneficial species, for *all* hawks, both large and small, are considered harmful and are dealt with accordingly. Another common practice is to place steel traps on poles about pigeon lofts, hen houses and enclosures for poultry, in attempts to catch marauding hawks. This latter method of dealing with the situation is to be condemned for its cruelty; birds thus trapped often escape with a broken or lost leg and so suffer a handicap in the struggle for existence and possibly even a slow death by starvation. It is much better to shoot outright an individual hawk that is seen or known to commit damage than to shoot or attempt to trap indiscriminately *every* hawk that puts in an appearance on the premises. The present species is really a friend of the farmer, and from an economic standpoint it is better policy not to molest it until the really injurious members can be identified with certainty.

Not only do hunters wage a constant warfare on all hawks, but even the very officials who have been appointed to look after the welfare of game locally—the so-called "game protectors"—fail to discriminate between the valuable and the harmful species of hawks. To them *all* hawks are vermin and these men apparently derive a great satisfaction in destroying every hawk that can be killed without too much effort. Without vouching for its authenticity, I venture to insert here an item taken from the June 17, 1930, edition of the "Syracuse Post-Standard," which illustrates this point very well (*italics mine*): "During May, 11 game protectors killed 214 crows, 143 purple grackles, 93 English sparrows, 85 water snakes, 73 starlings, 34 woodcocks [woodchucks], 24 cats caught hunting, 21 red squirrels, 19 *hawks*, 14 kingfishers, 11 snapping turtles, six milk snakes, two black snakes and one great horned owl."

As species, few of these animals are altogether harmful. To be sure, some occupy a border-line position economically, especially at certain seasons and under certain local conditions. But except the domestic cats, the woodchucks, the great horned owl and the starlings, all the animals mentioned above might well have been spared without detriment to fish or game.

"If birds of prey are to become popular a better understanding of biology is needed. The killing of organisms for food as an activity necessary to the perpetuation of life, must be more clearly apprehended. No one cringes at the thought of death of an unpopular caterpillar when a Cuckoo snaps it up; yet life to a lowly organism, biologically speaking, may be just as precious as it is to higher forms. Birds of prey will be better understood when it is realized that the pursuit of food throughout the world demands essentially the same furious conflict among all creatures . . .

"Our deepest, most sincere reasons for protecting wild-life are not, after all, based upon economic values. If we can make the public **sense the need** for these magnificent creatures in every one's experience, the preservation of

birds of prey which are now too rare will become an important and fascinating feature of the wild-life conservation movement." (Sutton, 1929, pp. 193-195.)

The red-shouldered hawk is about the size of a crow but it has a heavier body and a greater wing expanse. It is similar to but a little smaller than the red-tailed hawk; it differs from that species in lacking the red tail and in possessing markedly rufous lesser wing coverts and under parts. The wings and tail are distinctly barred with black and white.

Broad-winged Hawk. *Butco platypterus platypterus* (Vieillot).

From the number of times that I have observed the broad-winged hawk in the Oneida Lake region, I judge that it is a rather uncommon summer resident. Several May and June records are at hand from the wooded portions of the North Bay, Cleveland, Clay and Shackelton Point districts. At the hunters' cabin on the F. C. Soule estate are two mounted specimens of this species; one is an immature bird, the other is an adult; both were taken on the estate grounds in 1927.

While this hawk is reported to be a fairly common summer resident in most of the wooded districts of the State, particularly in the Adirondack forests, it is probably more generally known as a migrant. Migratory "flights" or groups of individuals are most likely to be seen in spring between mid-April and late May, and in autumn between mid-August and mid-October. Sometimes it winters over in the warmer parts of the State.

This is, for the most part, a woodland bird. Not only does it nest in such situations in late May and early June but it finds most of its food in and near wooded sections. Snakes, frogs, toads, lizards, crayfish and insects are the favorite food of the broad-wing. The insect food taken includes such destructive forms as grasshoppers, crickets, white grubs and large caterpillars of various kinds. Small mammals such as mice and shrews are sometimes eaten, and occasionally a bird falls victim to this hawk which, along with its congeners, is to be considered as a generally beneficial species. (At the Widrig woods north-east of Cleveland I flushed a bird from an alder-willow thicket through which ran a sluggish stream. All around was dense hemlock, beech and white pine forest.)

This is one of our smaller hawks, averaging about the size of the Cooper's hawk, but the under parts are darker than in this bird, being brownish or reddish brown, more or less barred and spotted with white; the upper parts also are darker than in Cooper's hawk. Tail fuscous with two broad bands and tip whitish. Ordinarily the flight of the broad-winged hawk appears heavy or labored, but if occasion demands it can give an excellent demonstration of speed. It can also soar. Its common whistled note has been likened to that of the wood pewee.

Southern Bald Eagle. *Haliaeetus leucocephalus leucocephalus* (Linnaeus).

Although it is probably a more or less permanent resident in the Oneida Lake region, all reports indicate that the bald eagle is commoner in spring and summer than at any other season and that, while its numbers are not to be

compared with those of thirty years ago, it is maintaining itself here in a fairly satisfactory manner. We saw it oftener during the 1929 season than in 1928. It nests in a few places in the immediate territory where several "eagle trees" are still to be found. Contrary to the current feeling in the case of the other raptorial birds here, popular sentiment favors the bald eagle and I believe that hunters seldom shoot at one.

The combination of lakes and bordering woodland found in this territory affords a satisfactory habitat for this species. On almost any day during the summer one or more of these great birds can be seen winging their way across Oneida Lake, or perching in some tall tree along the shore, scanning the surface of the water near by for dead fish, their principal diet at this season.

A few extracts from my field notes will give a better idea of the local status of this eagle. Certain of these notes refer to my own observations, others to the statements of local residents.

"May 22, 1928. Yesterday two men living at different points on the north shore of Oneida Lake told me that occasionally an eagle is seen in the vicinity of Three-mile Bay. They both said that there are at least two or three of these birds during the summer and more during the fall.

"May 22, 1929. Saw one adult soaring high above the lake at Shaw Point. Mr. Shaw says that he saw the first eagle of the season a week ago; since that time he has seen two.

"May 29, 1928. Saw an eagle in a dead tree at Shaw Point. Mr. Shaw tells me that he has seen four here, at one time, this year.

"June 28, 1928. This evening when near Cleveland, while returning from a field trip, I saw a single individual slowly flapping its way westward over the lake, toward the vicinity of Shaw Point.

"July 3, 1929. This A.M. I saw four eagles in a heavily wooded tract of about fifty acres lying one and one-half miles southwest of Lakeport; at least one—possibly two—of these were immature individuals. The birds were resting in tall elm and maple trees. In a huge, gnarled old elm, some seventy or more feet up, was the characteristic mass of sticks that had served for a nest, probably of these same birds. Under the tree the vegetation was well spattered with the excrement. Mr. William Parker who lives near by and who owns a portion of this woodlot says that two years ago he saw nine eagles here at one time, and that every day at 4:00 P.M. one or more of the birds would leave the wooded tract, flying south toward Black Creek two miles away.

"July 5, 1929. Saw two adults and one immature bird with black head and spotted plumage at the William Parker woods south of Lakeport.

"July 11, 1929. Flushed one in the Parker woods. Saw another east of Lakeport, flying in the direction of the Parker woods. Mrs. Charles Niles, who lives two miles southwest of the village of South Bay, tells me that bald eagles frequent the dense woodland on their farm.

"July 15, 1929. An adult with a fish in its talons flying over Verona Beach.

"July 20, 1929. Saw an adult and an immature bird flying about the Widrig woods in the Cleveland district. A resident of this locality tells me that 'a year

or so ago' this eagle nested in the woods near Conant's Pond, about three miles northwest of Jewell.

"July 23, 1929. Two adults in a tall tree at the south side of Vandercamp woods are being tormented by a group of crows.

"July 26, 1928. Two adults and an immature bird resting in tall elm trees in a partly cleared area at the south side of the Vandercamp woods northwest of Cleveland. Mr. T. Steenburg, game keeper for the owner, Mr. F. C. Soule, informs me that bald eagles take the young ring-necked pheasants which he is attempting to rear, and that a few days ago he shot at and wounded an eagle while it was in the act of seizing one of the pheasants. A few days later the eagle was killed here while making another raid on the pheasants. Mr. Steenburg says that he has seen five of these birds at one time on the Soule estate.

"July 28, 1929. Today near Jewell I saw two adult eagles fly into the woods. They were pursued and harassed by several crows and blue jays. Along the shore of Oneida Lake crows in particular make life miserable for the eagle for their interests often clash, both as to feeding grounds and perching trees.

"August 1, 1929. A single immature eagle circling high above the village of Constantia.

"August 4, 1928. One adult flying north from Oneida Lake over the Delahunt woods.

"August 6, 1928. Two adult birds flying over country near Bridgeport.

"August 10, 1928. One adult bird near Shaw Point, and in the evening an immature bird in a dead tree near the mouth of Three-mile Creek.

"August 12, 1929. One bird flying along edge of water at Verona beach and another observed at the Parker woods."

That the bald eagle frequents the islands of the lake freely is indicated by several sight records of its occurrence on Frenchman Island during both seasons, and a note under date of July 24 which reads as follows: "One adult bird perched in the top of a tall elm near the water's edge on the north side of the island. It took flight when I was only fifty yards away and I could plainly hear the swish of its wings as it arose from the tree."

A cottager at Delmarter Bay told me that during the summer bald eagles sometimes rest in the tall trees on Leete Island.

While on a visit to Wantry Island on July 8, 1929, I found two large feathers of the bald eagle, indicating a recent visit. Judging from the feathers found here and at the Parker woods a few days previously, it appears that the annual molt is under way at this season. About nine o'clock on the morning of August 2, 1929, while I was exploring Long Island, I chanced to glance across the water toward Wantry Island, a mile away, and made out plainly with my glass an adult and two immature bald eagles on that island. Evidently these birds use this bare island as a feeding ground, for many dead fish are cast up on its low shores by the waves, and I have seen scores of partly eaten carcasses here and elsewhere about the lake beaches. Although in mid-summer Verona and Sylvan beaches are frequently so covered with dead fish that the air becomes foul, and it is necessary to bury the carcasses as a sanitary measure, I

do not believe that the bald eagles visit these spots often, for these localities are too thickly populated.

Other localities and dates of observation for this bird might be mentioned, and while the foregoing paragraphs indicate something of the mode and places of occurrence, habits and general abundance of the bald eagle in the Oneida Lake region, it must not be supposed that all of the several records refer to different individual birds. No doubt the same birds were observed at frequent intervals. My belief is that probably at most not more than a dozen or fifteen individuals occurred in the territory under consideration during either of our summers of observation.

Regarding the status of the bald eagle in Madison County, Maxon (1903, p. 264) says: "Decidedly less common than formerly, but still to be seen on Oneida Lake. Lewis Point, near South Bay, has been a favorite nesting place for many years."

Ordinarily the flight of the eagle is slow, heavy and more or less labored, but if occasion demands it can be swift and graceful. The bird is said (Fisher, 1893, p. 101) to be "capable of carrying a weight exceeding its own." The female is larger and heavier than the male and a good sized example has a wing expanse of seven feet and a weight of ten or eleven pounds. Fisher (*loc. cit.*) further states that "At a distance the note of the Bald Eagle is not altogether unpleasant, resembling somewhat that of the sea gulls, but near by it is grating and suggests a maniacal laugh." About Oneida Lake I have seldom heard the bird utter its note, but a few times I have been near it as it gave a high-pitched, screaming call.

That the bald eagle nests in the region is indicated not only by the statements of local residents but also by our own observations. At least two eagle nests occur in this territory, one in the Shaw Point district and another in the Lakeport district. The huge mass of sticks that occupies the dead tops of tall trees in both places offers mute testimony. According to Herrick's observations (1924a, p. 218), "the Eagle builds anew each year, but uses the old nest as a site for the new one," so that in the course of time the nest becomes exceedingly bulky. Two whitish eggs make up the usual clutch which in New York State are said by Eaton (1914, p. 93) to be deposited in February or early March. He further states that the bald eagle is "the largest resident and earliest breeder of our diurnal birds of prey, as the Great horned owl is of our nocturnal Raptores." The incubation period is a month or a little more and the young do not leave the nest until July or August.

The principal food of the bald eagle is fish taken either dead or alive. As indicated by our findings in the Oneida Lake region, the quantities of dead fish that have been thrown upon the beaches of Oneida Lake form a constant source of food for the bird here during the summer, so that it is required to do but little fishing on its own account. In catching live fish the eagle seizes its prey in its talons after a rapid descent to the surface of the water, either from a high perch near the water's edge or while flapping slowly across it. The bald eagle is said also to rob its more active and smaller relative, the osprey, of

its booty while in the air by worrying it until it drops the fish, which is caught in mid-air by the alert eagle.

In addition to fish, the bald eagle captures larger birds such as ducks, geese and coots, as well as various kinds of small mammals. However, in this section, I believe that it seldom takes other birds, for an abundant supply of its favorite food—dead fish—is present throughout the summer.

Eagles have been reported to prey upon various smaller domestic animals, including poultry, but if such food is taken at all in a more or less populous community it must be on rare occasions. We have but a single record, above mentioned, of its attack upon game birds and in this region at least it is practically harmless in that direction, while it serves in some measure as a scavenger about the shores of Oneida Lake. Here at least this majestic bird deserves the consideration, favorable public sentiment and legal protection that have been accorded it.

"All things considered, the bald eagle is rather more beneficial than otherwise, since much of its food is of little or no direct economic value, while the good it does more than compensates for its obnoxious deeds; and furthermore it seems not likely ever to become abundant enough in any locality to be seriously destructive." (Oberholser, 1906, pp. 16-17.)

Adult birds are easily distinguished by the white head, neck and tail, while the rest of the plumage is brownish black. Immature birds are a nearly uniform brownish black with more or less white in the plumage during the second and third years. Adult plumage is not acquired until the fourth year at the earliest. Both adults and young have the lower third of the leg naked all around.

On June 20, 1782, the bald eagle by a vote of Congress was officially adopted as the symbol of the independence and sovereignty of the United States of America. On this account Herrick (1924, p. 214) suggests that the name "American Eagle" would be a more appropriate designation for our national bird.

Marsh Hawk. *Circus hudsonius* (Linnaeus).

The marsh hawk is by far the commonest representative of the order in the Oneida Lake region. Although it is most frequently seen hawking in its characteristic wavering flight over the marshes and open lowland meadows that so generally prevail in the territory south of the lake, it occurs in some numbers, also, in the open swales and waste fields throughout the north side districts.

Here, as in most portions of the State, this hawk is, for the most part, a summer resident. Early spring arrivals may be expected late in February or early in March, but the bulk of the movement at this season does not take place until late March or April. The return to more equable winter quarters which are principally in southern United States and on southward through Cuba and the Bahamas to northern South America, begins early in August and continues well into November.

A list of all the places in which we have observed the marsh hawk locally would include practically every field station visited. However, certain situations in the south side area seem to be particularly favored by this bird, evi-

dently either because of the abundance of food that may be found there or because more favorable nesting sites are offered. Perhaps the area of greatest abundance occurs in the region south of Lakeport and Bridgeport where, along the edges of the swamp, are vast expanses of open, grassy, hummocky fields of just the type that appeal to this hawk. Here, throughout the season, it courses low over the long marsh grass and stumps, searching for its favorite food, meadow mice, of which it must consume large numbers. This, too, is a likely breeding place, particularly a large hummocky tract that lies about one and one-half miles south of Lakeport. Although I found no nests here I feel sure, from the actions of numerous adults, both males and females, that young were being fed by them there in late June.

Another rather extensive favorite local stronghold of this bird is the Cicero Swamp south of Clay. While its habitat proper is not in the dense cat-tail marsh but rather in the open boggy meadows and sparsely wooded grassy tracts adjoining, this hawk is seen regularly coursing over the waters of Mud Creek or the small rush-bordered, open-water areas in the swamp proper. On these excursions into the marsh the hawks are often attacked and harassed by red-winged blackbirds; and not infrequently a belligerent kingbird or barn swallow joins in the chase.

Grassy cedar-hemlock bogs, too, are favorite resorts of the marsh hawk and I have found it in numbers amid these surroundings. One such bog about seven miles south of Lower South Bay, others in the West Monroe Cemetery district and still another three miles northwest of the village of North Bay afford good examples of this type of habitat.

Again, old, boggy, cut-over woodland that supports a dense growth of grass among its decaying stumps, furnishes an attractive foraging ground for this hawk. Such situations are usually frequented by hosts of field and woodland mice, and on that account numbers of marsh hawks are drawn to them. An area bordering a maple grove just west of the mouth of Chittenango Creek, certain stumpy parts of the Short Point and Shackelton Point districts and the Big Bay swamp, as well as the vast, rolling expanse that stretches away in billowing waves of long marsh grass to the eastward from the Toad Harbor road are all congregating places for this hawk.

Nor are the open, hilly sections north of Cleveland, Constantia and Jewell without some representatives of this marsh-loving bird, for even the grassy swales (Fig. 182) between the hills and about the ponds, creeks and clearings now and then attract it. Indeed, the entire region offers many situations that appeal strongly to the marsh hawk, so that it is fairly generally distributed.

The flight of the marsh hawk as it beats back and forth over the meadows is easy, regular and graceful, and seemingly tireless. Once a field mouse or other prey is discovered in the tall grass the bird hovers for an instant over it, then drops suddenly upon it, seizing it in its talons and bearing it away a short distance to a post or a stump to devour it.

This hawk is capable of giving a considerable variety of screams, calls and whistles. The note that I have heard here most often is a shrill scream,



Fig. 171. Blind erected for observation of shore birds on Wantry Island.
July 24, 1928.



Fig. 172. Bouldery shore on west side of Wantry Island. July 24, 1928.



Fig. 173. Spotted and pectoral sandpipers at north end of Wantry Island. July 19, 1928.



Fig. 174. East side of Wantry Island. Woods on north side of Oneida Lake in background. July 24, 1928.

"cha-cha-cha-cha-cha," with variations. It is noisiest during May and June, but by mid-July it has largely ceased its vocal efforts.

During the mating season the male marsh hawk frequently indulges in aerial gyrations and tumblings, presumably as attractions for the female. The bulky nest, which is placed on the ground in swampy or hummocky situations, is composed of grasses, weeds and twigs. In this section the three to seven bluish white eggs, variously marked with brownish, are likely to be deposited during the latter part of May. Both sexes are said to cooperate in nest-building, incubation and care of the young.

That the marsh hawk breeds successfully here is indicated first by its abundance and secondly by the fact that in late July and early August the preponderance of birds of the year is very marked. At this season the young that have left the nest are often found together, and later on the young from several families seem to form loose groups as they begin the southward movement.

Within certain limits the type of food taken by the marsh hawk is dependent upon the kind of prey available in the immediately surrounding territory, and to some extent upon the individuality of the bird. Stomach examinations made by investigators in the U. S. Biological Survey show that small rodents, lizards, frogs, snakes, insects and birds make up the bulk of its food. Among the rodents are such destructive forms as field and woodland mice, ground squirrels and cottontail rabbits, while among the birds taken are included a number of beneficial and highly insectivorous native species as well as the introduced English or house sparrow. Domestic poultry, too, sometimes makes up a part of the bill of fare of these birds, but I believe that the tendency to visit poultry yards is largely an individual matter and not a characteristic of the species as a whole.

In the Oneida Lake region I have not often observed marsh hawks in the vicinity of farmyards. However, I have noted the tendency to visit such situations most frequently in the Lakeport district. On July 11, 1929, while driving by the Charles J. Niles farm two miles southwest of the village of South Bay, I saw a dead male marsh hawk nailed to the side of the barn near the highway. Upon inquiry at the farmhouse concerning the history of this bird I found that it had been shot about three weeks earlier, while it was in the act of carrying away a full grown domestic fowl weighing between three and four pounds. When the hawk was shot it released its hold upon the fowl which, though somewhat injured, was able to walk. Mrs. Niles told me that for some time this hawk had been persistently taking her chickens.

This incident suggests merely that certain *individuals* may acquire the habit of frequenting chicken yards and of destroying domestic poultry, but it is quite unnecessary to condemn and seek to destroy *all* marsh hawks on that account. Usually the elimination of the offending individual will be all that is necessary to promote the safety of the fowls, at least in that particular locality.

Dr. A. K. Fisher of the U. S. Bureau of Biological Survey, whose painstaking and valuable studies (1893) have contributed so much to our knowledge of the food habits of hawks and owls, sums up (*loc. cit.*, p. 29) the economic status of the marsh hawk as follows:

"Although this Hawk occasionally carries off poultry and game birds, its economic value as a destroyer of mammal pests is so great that its slight irregularities should be pardoned. Unfortunately, however, the farmer and sportsman shoot it down at sight, regardless or ignorant of the fact that it preserves an immense quantity of grain, thousands of fruit trees and innumerable nests of game birds by destroying the vermin which eat the grain, girdle the trees, and devour the eggs and young of the birds.

"The Marsh Hawk is unquestionably one of the most beneficial as it is one of our most abundant Hawks, and its presence and increase should be encouraged in every way possible, not only by protecting it by law, but by disseminating a knowledge of the benefits it confers. It is probably the most active and determined foe of meadow mice and ground squirrels, destroying greater numbers of these pests than any other species, and this fact alone should entitle it to protection, even if it destroyed no other injurious animals."

In flight the marsh hawk may be easily recognized by the long tail and by the large white patch on the rump. The adult male has the upper parts gray or ashy and the lower breast and belly white marked with rufous. The adult female has the upper parts brownish and the under parts ochraceous buff or brownish yellow streaked with darker. Immature birds are similar to but darker than the female.

Osprey. *Pandion haliaëtus carolinensis* (Gmelin).

The osprey or fish hawk was observed on only two occasions during our investigations. On the morning of May 3, 1929, I saw one flying over Oneida Lake near Maple Bay. An hour later I again saw an adult male circling about over the lake and adjoining maple woods near the mouth of Chittenango Creek. Since the latter point is only a short distance from Maple Bay—by water—and, since the elapsed time between the two observations was so brief, it is altogether possible that the same bird was seen on both occasions.

Sadler (1926, p. 9) records the osprey from Brewerton on April 24, 1915, and Dr. C. E. Johnson reports a single individual from the Sylvan Beach district on September 9, 1927.

While one might expect to find the osprey occasionally about so large a body of water as Oneida Lake it, too, has suffered from the inroads of ruthless gunners who shoot at any large or unusual bird, so its numbers have been much reduced in recent years. "In the interior counties of New York the Osprey is no longer a summer resident, except in portions of the Adirondacks, where it continues to breed but yearly becomes rarer and rarer on account of the relentless persecution of thoughtless tourists and campers." (Eaton, 1914, p. 106-107). As a migrant, this bird may be expected about the inland waters of the State between March 25 and April 15 in spring, and from August 20 to October 25 in autumn.

The osprey usually nests in tall dead trees near water. Its bulky nests and the positions they occupy are similar to those of the bald eagle. Indeed, I have known of a nest constructed and used originally by a bald eagle that was later occupied by a pair of nesting fish hawks. Sticks, brush, rubbish, bark, leaves and a miscellaneous lot of materials enter into the construction of the

nest, to which yearly additions and repairs are made. The two to four buffy white eggs heavily marked with dark brown are most likely to be found from late April to early June.

The osprey is sometimes mistaken for the bald eagle which also frequents the vicinity of water. However, the former is of slighter build, has a somewhat smaller wing expanse and the under parts are white.

The food of this bird consists practically entirely of fish, which it seizes in its powerful talons. Unlike all our other raptorial birds, the grasping surface of the toes is thickly set with sharp, horny spicules which, together with the reversible outer toe, form an efficient apparatus for seizing and holding a slippery and wriggling fish. In securing its prey, the osprey descends vertically and swiftly, striking the water breast first, often plunging beneath the surface in its effort. Fisher (1893, p. 130) reports that in the lower Hudson Valley, New York, he observed the bird taking only menhaden, herring, goldfish, or sunfish. In addition, shad, catfish, perch, trout and sometimes bass or other fish serve as food. In general, however, most of the fish taken by the osprey are not particularly desirable as human food.

CARACARAS AND FALCONS: FAMILY FALCONIDAE.

Eastern Sparrow Hawk. *Falco sparverius sparverius* Linnaeus.

This trimly built little hawk seems not to be a common bird in the Oneida Lake region. I never saw it in the territory lying immediately north of Oneida Lake, but only in the open pastures and fields to the south and west of the lake or in the second growth woodlands immediately adjoining it on the east. I am not surprised at the comparative scarcity of this bird here for every hawk, large or small, is considered locally as "vermin," and any kind of predacious bird except the bald eagle is to be congratulated if it escapes a charge from some hunter's gun for a season. However, I do not believe that any of the local nimrods would wantonly kill an example of our national bird.

Although the sparrow hawk is, properly speaking, a summer resident here, it is not unlikely that individuals may winter over successfully under favorable conditions. Spring migrants may be expected early in March and the movement continues well through April. September ushers in the beginning of the post-breeding, southward movement.

In this region flat, open country seems to be preferred by the sparrow hawk and I have observed it most frequently in the Bridgeport district. About a mile west of the village, in open pastures, stand two old decaying trees. In the hollow trunk of one of these a pair of sparrow hawks reared a family of young. The other, 200 yards away, had been girdled by the owner and its dead trunk and limbs had lost most of their bark. This tree afforded a lookout for the sparrow hawks during the nesting season (Fig. 181). We often saw them sitting there waiting to pounce down upon a field mouse, grasshopper or frog, or merely surveying the surroundings. During both the 1928 and 1929 seasons, the species was noted here. In no other area in the region did we find it regularly present. Indeed, during the first season we saw the sparrow hawk at only four other

places, once in the Lewis Point district on May 24; at Oakland Beach on June 30; at a barnyard two miles south of Brewerton on July 16; and a pair was seen in a field about two miles south of Bridgeport on July 20.

Strangely enough, during the summer of 1929, the species was seen only in the Bridgeport and Cicero districts. These observations and records, though few, suggest that the sparrow hawk is not common in the region.

The flight of the sparrow hawk is light and swift or more labored and irregular as occasion demands. During migration resting periods between its flights are frequent. The bird seldom soars as do most other hawks. In feeding it frequently hovers over its intended prey, when with a quick swoop it seizes it and flies away to a nearby telephone pole or limb of a dead tree to eat it. Under excitement it gives vent to a shrill, rapidly-repeated "*kili-kili-kili*" as it flies about. This call has given rise to one of the bird's colloquial names, "*kili hawk*."

The sparrow hawk usually nests in a hollow tree or stub where a natural opening exists, or in an abandoned hole of a woodpecker. Nesting materials are scanty or altogether lacking. In the Oneida Lake region one may expect to find eggs from late April to early June. They vary in number from three to seven, and in color from whitish to buffy or rufous with a diversified assortment of darker markings and configurations. Sherman (1913, pp. 407-408) indicates that the incubation period varies from twenty-nine to thirty-four days, and says that the greater share of the incubation is performed by the female.

An excerpt from a field note that I made at Oakland Beach on June 30, 1928, relates to a pair of sparrow hawks that we found nesting there in the top of a dead stub of a maple tree, in a grove about fifty yards from the lake shore and thirty yards from the State road (Fig. 183). The immediate surroundings are low and flat, while a number of inhabited summer camps are located not far away.

The nest was about twenty feet up in a cavity made by a woodpecker. Apparently the limb was decayed and had broken off, leaving the jagged end of the stub open to the sky so that the hawks could enter either through the opening made by the woodpecker or through the broken end of the limb.

When we arrived on the scene the female was flying about, carrying a field mouse for the young, of which there were five (Fig. 184). They were in the down, but the quills of the wings and tail were beginning to show the reddish brown so characteristic of the adults. Borrowing a ladder from a neighboring camper I secured the young for banding and photographing. During this procedure the adults were excitedly flying about and calling their "*kili-kili-kili*." As I was removing the little birds from the nest the female flew very close to me but did not touch me. The young attempted to defend themselves characteristically by lying on their backs with the legs extended and the talons ready for action, but they were not strong enough to inflict injury.

The extensive and elaborate studies on the food of this hawk made by Fisher (1893, pp. 115-127) indicate that, while it does take some small insectivorous birds, it is a great destroyer of grasshoppers and mice, both of which are noxious forms so far as man and agriculture are concerned. With respect

to its food habits Fisher (*loc. cit.*, p. 116) says: "The Sparrow Hawk is almost exclusively insectivorous except when insect food is difficult to obtain. In localities where grasshoppers and crickets are abundant these hawks congregate, often in moderate-sized flocks, and gorge themselves continuously. Rarely do they touch any other form of food until, either by the advancing season or other natural causes, the grasshopper crop is so lessened that their hunger can not be appeased without undue exertion. Then other kinds of insects and other forms of life contribute to their fare; and beetles, spiders, mice, shrews, small snakes, lizards, or even birds may be required to bring up the balance."

Although this bird is not sufficiently abundant in the Oneida Lake region to be of particular economic importance, the general policy of permitting most hawks and owls to live might well be extended to this representative for it is in the main quite harmless and its value in destroying noxious insects and rodents is of some moment.

Male: upper parts rufous with or without black spots or bars; wings narrow, pointed, grayish blue, more or less spotted with black. Tail rufous, crossed near tip by a broad black band; tip white; a black mark before and behind the white ear coverts. Under parts varying from white to rufous, more or less spotted with black. Female: back, wings and tail heavily barred with black.

ORDER GALLIFORMES

GROUSE, ETC.: FAMILY TETRAONIDAE.

Eastern Ruffed Grouse. *Bonasa umbellus umbellus* (Linnaeus).

Local reports concerning the status of the ruffed grouse in the Oneida Lake region are conflicting, and without having spent more time in the likely haunts of the bird in this territory I am not prepared to evaluate the various statements concerning its abundance and distribution. Therefore it seems safer to confine my remarks principally to my own observations and permit the reader to draw his own conclusions.

That the status of the ruffed grouse, or "partridge" as it is called here, varies considerably locally from season to season seems apparent, for during the entire 1928 season I came upon the bird only four times, while in the 1929 season adults and immature birds were encountered frequently. However, the bird is not so common but that some more detailed remarks of the surroundings and the circumstances connected with certain of our observations will be of interest. Accordingly, I am presenting certain excerpts from my field notes, relating mainly to the abundance, mode of occurrence and distribution of the bird.

"June 8, 1929. About a mile north of Emmons' woods the highway runs through a heavily wooded swamp. Today we saw a single grouse here. Evidently it had been dusting or sunning itself in the highway for as we approached it slowly retired to the woods at the side of the road, elevating and depressing its ruffs from moment to moment.

"June 28, 1928. Saw one individual in the Vandercamp woods today. Judging from reports, this species is more plentiful than my two personal records thus far would indicate. Mr. T. Steenburg, gamekeeper on the Soule estate, tells me that partridges occur occasionally in the Vandercamp woods. Several times

during the 1929 season adult birds were seen here; and that it breeds in the area is indicated by the finding of young of the year on July 23, 1929.

"July 18, 1928. In the Muskrat Bay district today I flushed a covey of five grouse in the woods at the edge of the swamp, toward the east end of the 'island.' When they arose from the ground two of them lit in trees before flying farther, while the others flew off into the woods where they lit in an area of tall grass.

"July 31, 1928. Beech-maple-hemlock-birch woods one mile southeast of Constantia Center. One grouse resting under a fallen hemlock tree.

"May 14, 1929. Flushed one bird, possibly two, but could not be sure, in beech-maple-hemlock woods one-fourth mile south of Clay. The terrain here is rolling and some cover is afforded by blackberry bushes and other small vegetation.

"May 18, 1929. Flushed one grouse in maple-birch-hemlock woods near the highway about two miles northeast of Cleveland.

"June 8, 1929. Mrs. Stoner saw one bird dusting and sunning itself in the highway that extends through the heavy mixed woods about two miles northeast of Jewell.

"July 11, 1929. Flushed a large covey of about half-grown ruffed grouse in a low-lying mixed woods, one and one-fourth miles southeast of Lakeport and just east of the William Parker woods. The adults were continually calling to the dispersed young. There is a considerable amount of undergrowth here and the cover thus afforded makes this an ideal breeding place; for neither this woodlot nor the adjoining Parker tract of about twenty acres is pastured, nor often visited by humans. Mr. Parker tells me that the grouse has nested here regularly in previous years.

"July 19, 1929. Flushed a small covey, of which at least some were young of the year, in mixed woods about two miles north of Bernhard Bay. The birds were sunning themselves in an open place in the dense woods."

While apparently it was formerly common throughout the State, this bird now has become comparatively rare in the more thickly settled districts. However, in the wooded areas and in unpastured burned-over and cut-over tracts where abundant cover and food are to be had, the ruffed grouse is making a determined stand for survival. Such favorable habitats are not uncommon in the districts north of Oneida Lake and in the larger isolated wooded tracts south of it. Our personal findings indicate that the species is not common in the region but that it occurs generally and that it breeds successfully under undisturbed conditions. Without doubt this fine game bird would re-establish itself in favorable localities, both here and throughout the State, if it were afforded proper protection.

The eastern ruffed grouse prefers the wooded sections where it can find ample cover and food. Open places in the forests, with old logs or fallen timbers and a profusion of shrubby vegetation are its favorite resorts. It is a highly terrestrial bird and when flushed rises with a loud and disconcerting whir of its short, deeply concave wings, to fly usually in more or less of a circle and to no great distance before alighting. After such flights it often comes to

rest on the lower branches of trees. The bird is not gregarious although, as indicated above, the young of the year often remain with the female for some time, even throughout the first winter.

Perhaps the item of greatest interest concerning the grouse and the habit about which most has been written is its drumming which is the mating call of the male. In early spring the birds begin to display themselves and to drum while standing usually on a decayed, moss-covered log in the woods. The exact method by which this sound is produced has been the subject of much controversy, but the studies of Sawyer (1923, pp. 355-384) afford a most critical and detailed analysis of this mooted topic. He says (*loc. cit.*, p. 359): "I have watched at the distance of a dozen feet the beginning, progress and ending of at least a hundred drummings. Each instance was a demonstration of at least one fact—that the forceful, sound-producing blow is the *outward and upward* (not the downward and inward) motion of the wings!" Again (*loc. cit.*, p. 360) he says: "I believe I am fully prepared to state that the drumming is caused by the wings striking the air alone. Whatever part in the sound may be taken by any other part of the bird than his wings must be very slight and merely incidental . . . The stiff primaries give forth the loudest part of the sound; the soft innermost secondaries the least. The entire 'thum' of each wing-beat is simply the total sound from all the wing feathers heard in unison." The birds frequently perform in fall as well as in spring, and it is said (Eaton, 1910, p. 370) that the favorite hours for indulging in this performance are at day-break, in mid-forenoon and mid-afternoon.

The nesting season ordinarily occurs from mid-April to about June 1. The nest of leaves is placed in a slight depression on the ground in wooded or semi-wooded surroundings. From eight to fourteen eggs constitute the usual clutch. They are usually plain buffy in color. On June 18, 1928, a farmer living on the State road one and one-half miles west of Jewell told me that about June 4 or 5, in the woods just north of his place, he had come across a ruffed grouse escorting twelve to fifteen very small young ones. The young are extremely precocial and are able to run about within twenty-four hours after hatching. A great deal of solicitude for them is said to be displayed on the part of the parent, and they continue to follow her for some weeks or even months.

Although in due time the young can fly, and often perch or roost in trees, they are nevertheless highly terrestrial and spend most of their time upon the ground. During their early life in particular, grouse are subject to a great many dangers. Not only do they suffer from adverse weather conditions, but also such predators as foxes, minks, weasels, cats, great-horned owls and Cooper's hawks exact a heavy toll. In view of the many vicissitudes of nature and inroads of man to which the ruffed grouse is subject there is little wonder that great depletion of the species has resulted. Rather, the wonder is that its numbers have been so well maintained.

"Half of the bird's food consists of browse (that is, buds and leaves), more than a fourth of it of wild fruits, and more than a tenth of various seeds. The buds of poplar, birch, and willow alone make up over a fifth of the partridge's

diet, but a variety of other buds and leaves are eaten including those of alder, hazel, beech, maple, ironwood, hornbeam, and apple . . . Slightly more than ten per cent of the partridge's diet is composed of insects, and most of them are injurious forms." (McAtee, 1926, pp. 20-21). Caterpillars, beetles, ants and larvae of sawflies make up a considerable bulk of this.

In general the food habits of the ruffed grouse are beneficial or more or less neutral, although at times it may cause injury to trees through its destruction of buds. The main value of the species lies, however, in its importance as a game bird.

A good deal of legislation has been enacted at one time or another looking toward protection, usually more or less temporary, of this bird, and closed seasons have been placed upon it in an effort to accomplish the desired end. However, these closed seasons are usually so short, the number of hunters is so large and the amount of suitable cover for the birds so reduced that the species is actually not holding its own. An army of 600,000 hunters let loose every year in New York State for a period of six weeks—too long an open season—is not likely to improve the situation of the ruffed grouse or any other species of game bird that has been reduced to a similar numerical status. The only adequate remedy for existing conditions with respect to the ruffed grouse would seem to lie in at least alternate open and closed seasons—perhaps one short open season to every two closed seasons—more efficient warden service, the establishment of preserves and sanctuaries of sufficient extent, more explicit regulation regarding the bag limits and, on the part of everyone, a greater willingness to obey the law and to pay the price necessary for permanent preservation of this great game bird.

Upper parts rufous, variegated with black, buffy, yellowish, gray and whitish; ruffs blackish, iridescent; tail rufous or gray with a broad subterminal band of blackish. Under parts whitish tinged with buffy and barred with blackish or brownish; a broken blackish band on the breast.

PHEASANTS: FAMILY PHASIANIDAE.

Ring-necked Pheasant.

Phasianus colchicus torquatus Gmelin

The stately and handsome ring-necked pheasant was first successfully introduced into the United States in 1881, when a shipment of twenty-eight birds was sent from China to Oregon. This importation prospered and others followed. These birds succeeded so well that in 1894, within a period of three months, it was estimated that 13,000 birds were killed by hunters in a single county of that state.

This pheasant was first successfully introduced into the eastern United States in 1887, and following the success which attended the early introductions the rearing of pheasants on state and private game farms has come to be a considerable industry. The birds are hardy and active, resistant to disease and sufficiently aggressive and prolific to compete successfully with native species of birds of similar habitat preferences.

Among its many activities looking toward the betterment of game conditions in the Commonwealth, the New York State Conservation Department main-



Fig. 175. Dunham Island from shore at Lower South Bay. July 12, 1929.



Fig. 176. South end of Frenchman Island. Water lilies, cat-tails and sedges. Feeding place of great blue heron and common black duck. July 24, 1928.



Fig. 177. Small cat-tail bordered bayou at trolley station, Lower South Bay. Feeding place of horned and pied-billed grebes. July 17, 1928.



Fig. 178. View along north shore of Long Island. Sept. 9, 1915. (Photograph by F. C. Baker).

tains a number of game bird farms where, with other species of birds, considerable numbers of ring-necked pheasants are reared for stocking purposes. In 1928 the Department received 528 applications for eggs and 928 applications for birds. In answering these requests 16,459 pheasants were distributed among the sportsmen of the State for covert stocking purposes, while 4,000 young females were retained for breeding purposes at the four game farms. In the same year 148,920 pheasant eggs were shipped. That the bird has continued to do well here since its introduction about twenty-five years ago is indicated by the following statement from the Eighteenth Annual Report of the State Conservation Department (p. 262): "The number of pheasants reported taken by hunters during the four-day open seasons from 1922 to 1926 inclusive follow: In 1922, 94,547 pheasants; 1923, 122,403 pheasants; 1924, 130,143 pheasants; 1925, 156,362 pheasants." From this it will be seen that the industry is of no mean proportions and that the attempt to supplement the natural supply of game through importation and stocking has met with much popular favor and a fair degree of success.

Occasionally the efforts of the State Department in rearing and liberating ring-necked pheasants are supplemented by private enterprise, such e. g., as that displayed during the 1928 season on the Soule estate north of Cleveland. Here the gamekeeper, Mr. T. Steenburg, had a series of houses and coops in more or less protected surroundings and was rearing young birds with some success. On July 26 he had about 100 juveniles seven weeks old which would soon be ready for liberation on the estate. He had been able to get 154 chicks from 200 eggs, a fairly good hatch. In addition to weather conditions the principal single menace to the young birds was the danger of attack from hawks and—according to his statement—the bald eagle. In spite of constant watchfulness a good many young pheasants fall prey to these predators, and I suspect that in a state of nature the mortality among them from this source is high. In one afternoon, Mr. Steenburg stated, he lost thirty young birds through the ravages of hawks, of which the sharp-shinned was the greatest offender. A bald eagle that was hovering about the place was shot.

In the Oneida Lake region, as well as in most of the territory in central New York where this pheasant has become established, it is a fairly common bird. For the most part it frequents the low or rolling open fields about the edges of woodland and often enters the protective cover of thicketed woodlots. Open woods which support a growth of low bushes and long grass are favorite haunts; as are also the grassy margins of cultivated fields. But low, flat hay meadows and grain fields are also often visited by them. While I have found this pheasant generally distributed throughout the territory surrounding Oneida Lake, it is commonest in the lower and flatter districts lying to the south and east. The hilly and wooded sections of the north side do not appeal so strongly to it, although it is found in the clearings and about the borders of the woodlands there. Localities in which the ring-neck is common include the Lower South Bay, Bridgeport, Lakeport, South Bay, Short Point and Clay districts. While the swamps proper do not seem to attract the bird, at

least during the summer, the open marshy ground and the thickets bordering them afford favorite resorts.

As one drives through the countryside he often hears the harsh "*kock-kock*" of the male bird, or sees a pair of the birds running rapidly across a cultivated field. The males indulge their vocal powers most in early morning and again toward evening when, in the Lower South Bay and Clay districts, their strident notes are heard at frequent intervals, coming across the expansive meadows from the thicketed fence rows and wooded margins beyond. Without doubt this bird was more plentiful throughout the region in the 1929 season than during the preceding one, and all indications point toward a steady increase in numbers here.

During the mating season the cock indulges in strutting, crowing and flapping his wings much after the manner of the barnyard fowl. Nests with eggs may be found from late April or early May well into July, so it seems likely that two broods are sometimes reared in one season.

The nest is usually built in open, bushy pastures, in marshy hay or in grain fields, or in sparse woodland. Leaves, grass and straw usually comprise the nesting materials. From six to twelve olive-brown eggs make up the usual clutch. Sadler (1926, p. 8) records a nest with seventeen eggs in a meadow near Baldwinsville, on May 10, 1924. On May 13, 1929, a farmer at South Bay told me that he had seen young out of the nest. This is my earliest breeding record. The young are extremely precocial but stay with the female for some time after they are hatched. If danger threatens, the young remain motionless, hiding in the grass where their colors blend so well with the surroundings that their detection is difficult. Sometimes the female, too, "lies close," particularly if she is incubating. When young are with her, however, she often flies a short distance away, as if to distract the attention of the intruder from the young.

Mr. William Moss, a resident in the Lower South Bay district, told me that on or about May 24, 1929, he found a nest of the ring-necked pheasant in a grassy field on his farm. This nest contained ten eggs, and since he wished to plow the field he gave the eggs to a neighbor who placed them under a brood hen which hatched them successfully. On the same day in the same field he found another nest containing thirteen eggs.

On June 22, 1929, road workers reported a covey of young in the highway along Chittenango Creek, about two miles northwest of Bridgeport.

Tracts of hay land are favorite nesting sites of the pheasant here, and I have no doubt that many nests and eggs are accidentally destroyed when the hay is cut, although, if the nest is discovered in time the farmer usually mows around it. Mrs. Charles J. Niles, who lives on a farm near Whitelow, informed me that young pheasants were found alive "in the nest of some kind of large hawk" that nested on the farm in the summer of 1926. Her sons made an unsuccessful attempt to rear these young which they removed from the hawk's nest.

On July 18, 1928, in a meadow near the edge of the swamp one-half mile south of the Ladd residence in the Muskrat Bay district, I found a female in-

cubating six eggs. The tall blue grass and timothy in this field had been cut a few days previously, but the mower had left uncut a small patch about the nest. I approached to within a few feet of this pheasant and set up my camera at a distance of four feet without flushing her. Although she was on the alert all the time during my operations, she did not leave the nest until I had taken a photograph and then touched her lightly with a short stick. It is probable that this (Fig. 185) was a second clutch, for the species ordinarily nests earlier in the season and has a greater number of eggs at that time.

Investigations of the food habits of the ring-necked pheasant show that it feeds to a considerable extent upon weed seeds and upon the fruits, buds, leaves, stems, shoots and roots of various wild and cultivated plants. Among these items the seeds of smartweed, foxtail, wild millet and ragweed are eaten liberally, while such fruits as wild grape, choke cherry, elder and hawthorn also form an important part. In addition the birds eat a considerable amount of cultivated grain, but much of this is probably waste that is picked up in the fields. However, I have heard complaints in other parts of the country that these birds destroy newly planted corn and other cultivated crops, among which are potatoes, tomatoes and various kinds of garden truck. On the other hand the bird eats a good many insects, including grasshoppers, crickets, moths, caterpillars and beetles. Many of these forms are injurious, so that in striking a balance regarding the economic status of this pheasant it must be said that in general its beneficial qualities outweigh the injurious, except possibly in certain agricultural communities where the birds have become too numerous. Their value as game is of course to be considered as an important asset and that they possess a certain æsthetic value cannot be denied.

I have talked to a number of farmers in the Oneida Lake region concerning their attitude toward the ring-necked pheasant, and while they admit that now and then the bird may do some damage to corn, the sentiment toward it is almost wholly favorable. The farmers like to see the birds about their places and will go to some pains to avoid destruction of any nests or eggs that may be found in the fields. Not infrequently during heavy snows and severe weather in winter pheasants congregate about farm buildings, seeking food and shelter. At such seasons the farmers often feed the birds. Mr. Griner, a resident of the South Bay district, says that in the winter of 1928-29 he fed about twenty-five pairs of the birds in the vicinity of his farm buildings, and Mr. Eastwood, of the Lower South Bay district, told me that from three to six pheasants were early morning visitors about his chicken yard and vicinity all through the winter.

The attractiveness and the neutral or mainly harmless economic status of the pheasant together with its value as a supplementary game bird all tend to render it popular in the territory about Oneida Lake.

While not likely to be mistaken for any other bird, the outstanding field characters of the male may be briefly indicated as follows: head and neck, green; a conspicuous, more or less complete white neck-ring; breast, bronze-red, highly metallic; tail, long, streaming, pointed and folded. The female is much less conspicuous, being mottled above with black, brown and yellowish, and having the under parts yellowish brown with sides and flanks brownish black; tail

shorter, barred and pointed. Mr. Griner reported that he had seen an albino male and a partial albino female in the South Bay district, which the local hunters had been making particular effort to secure.

ORDER GRUIFORMES

RAILS, COOTS, GALLINULES, ETC.: FAMILY RALLIDAE.

Virginia Rail.

Rallus limicola limicola Vieillot.

The Virginia rail is by far the most plentiful and generally distributed rail in the Oneida Lake region during the summer months. Not only does it occur in numbers in the extensive cat-tail marsh southwest of Clay, but also in many of the smaller grass- and flag-covered marshes that are scattered throughout this territory. I believe that it is even more plentiful than the Florida gallinule, and certainly more generally distributed. Early spring arrivals are likely to appear locally in the latter part of April. In October the birds leave for their winter home in the Southern States, Cuba and Central America.

By May 1, when my investigations began, the Virginia rail was present in numbers among the cat-tail growth along Mud Creek in the Cicero Swamp, one and one-half miles southwest of Clay (Fig. 167). At this time the "grunting" of these birds could be heard all over the swamp, which is the local stronghold not only of the Virginia rail but also of the Florida gallinule and the sora rail. Other localities and first dates of observation of the Virginia rail include the following:

May 9, 1929. Cat-tail marsh one and one-half miles northwest of Hall Island. Several individuals; doubtless breeds here.

May 11, 1929. Among the willows about a boggy pond in a low flat near the mouth of Chittenango Creek. Several subsequent visits failed to reveal its presence here.

May 13, 1929. Heard one in the willow and cat-tail marsh in the South Bay swamp, in the vicinity of Oneida Creek northeast of the village of South Bay. A probable breeding place.

July 8, 1929. Heard the bird in a cat-tail-arrow arum-willow swamp near the shores of Oneida Lake one mile southwest of Short Point. This is the first time I have found the bird so close to the lake. The conditions here simulate in miniature those found in the Cicero Swamp southwest of Clay. Probably breeds here.

July 16, 1928. Saw one adult in the cat-tail marsh at Coble Point.

July 28, 1928. A cat-tail-grass-alder swamp near Fish Creek railroad station. Heard the Virginia rail here, which is a likely breeding place.

August 3, 1928. Saw one adult, and two young in black plumage—just a little brownish showing among the feathers on the breast—in a cat-tail marsh north of the railroad track about one mile west of the West Monroe railroad station. The young birds were almost as large as the adult but the bill was entirely black.

No doubt still other cat-tail and grass swamps in the region harbor numbers of nesting birds, but the records just cited will serve to show something of the



Fig. 179. Nest of eastern green heron; contains five young. Emmons' woods. June 17, 1929.



Fig. 180. Nest and four eggs of eastern least bittern. Cat-tail marsh in Coble Bay district. June 23, 1930. (Photograph by W. A. Dence).



Fig. 181. Dead shag-bark hickory tree in open field one mile west of Bridgeport. Lookout perch for eastern sparrow hawk. July 24, 1929.



Fig. 182. Grassy marsh at Shaw Point. Habitat of marsh hawk, eastern red-winged blackbird and Wilson's snipe. May 22, 1929.

general occurrence and abundance of this bird as compared with its relatives the sora and the Florida gallinule.

The Virginia rail is fond of marshy pools and cat-tail jungles, arrow arum thickets (Fig. 166) and swamp loosestrife canopies. While it is wary it is less so than the sora, and if the observer remains quiet and motionless he may have the thrill of seeing the bird at very close quarters. This rail seeks safety by running rather than by flying. It darts through narrow openings in the rushes and runs over partly submerged vegetation with extraordinary rapidity. As with the other rails its flight appears weak and vascillating, the bird scarcely rising above the tops of the marsh vegetation. However, it performs long migratory journeys over thousands of miles that intervene between its winter and summer homes. During these migrations the bird often flies into telephone and telegraph wires, and the mortality from this cause is considerable. The Virginia rail also is a good swimmer and diver, and often in order to conceal itself from danger hides under the water beneath an overhanging tussock of grass or clump of arrow arum, with only the bill protruding from the surface. It is most active and noisy as evening comes on, and it was at this time of day that we observed it to best advantage.

Our observations regarding the Virginia rail in the Cicero Swamp southwest of Clay are summarized in my field notes for the summer of 1928 as follows.

"July 6, 1928. Although I actually saw but three different individuals in the marsh this forenoon, I heard scores of others. This is one of the commonest birds here, and the most abundant representative of the Rallidae. These rails feed about the pools of water surrounded by arrow arum, marsh grass and cat-tails (Fig. 168), and retire quickly to their shelter when alarmed. However, they run about and feed unconcernedly, apparently heedless of the frequent trains passing within forty feet of them. When I wish to observe them I must hide in the rushes or wait motionless for some time before they will appear.

"Watched one adult feeding along the railroad embankment that extends through the marsh. It walked slowly in the small pools of water, probing rapidly from side to side, sometimes stopping for a few moments to probe more deeply into the muddy ooze, frequently immersing both bill and head. It would then move on again to investigate elsewhere, uttering at frequent intervals a coarse 'kak' as it fed.

"July 7, 1928. Saw several of these birds in the marsh today and heard others calling and grunting all through the heavy cat-tail and arrow arum growth. Indeed, at times in certain places in the marsh where numbers of the rails seemed to be congregated, I was reminded of an Iowa barnyard at pig-slopping time, for when both young and adult rails vocalize at the same time a sound not unlike the squealing of pigs is produced.

"Saw an adult with a family of three downy black young cross a small pool. First the adult *flew* across; then, after some encouragement by the continued calling of the parent, the youngsters followed at intervals. They ran across the watery expanse as far as the thick scum of duckweed would bear their weight then plunged boldly into the water and *swam* easily and with short, rapid strokes to the point where the parent had vanished into the vegetation.

"July 11, 1928. 6:00 A.M. This rail is abundant in the marsh; its voice is heard on all sides, the harsh 'ka-ka' mingled at intervals with the squealing note of the adults and young. These notes are a prominent part of the characteristic marsh sounds heard here.

"Saw many downy black young. One of these rails approached to within ten feet of me as I stood motionless among the cat-tails. Their wariness was more pronounced earlier in the season than it is now.

"August 7, 1928. Saw several birds and heard others, but their vocal efforts seem to have diminished somewhat now compared with a few weeks ago."

The nest of the Virginia rail is constructed of weeds, grass and reed stalks, and is more or less concealed by the surrounding vegetation. From seven to twelve eggs are laid, but eight to ten constitute the usual number. Although subject to a good deal of variation in color they are usually some shade of buff, irregularly marked with brownish. Bent (1926, p. 301) gives egg dates for southern New England and New York as follows: "62 records, May 14 to August 6; 31 records, May 24 to 31." Sadler (1926, p. 5) records a nest with eggs at Long Branch on June 9, 1913. Although I found no nests with eggs, my first sight of young was on June 18, 1929, when I saw several broods attended by adults in the Cicero Swamp southwest of Clay. These downy black youngsters were about the size of week-old chicks. Since the period of incubation is said (Bent, *loc. cit.*, p. 294) to be not less than fifteen days, and since downy black young were seen here well into July it appears that two broods are reared in a season. This probability is further strengthened by the observations of Saunders (1926, p. 424) in the Montezuma marsh, where downy young were first seen on July 7, and as late as August 13. Young Virginia rails are to be distinguished from young soras by the much longer bill, which is encircled by a broad black band between the yellowish tip and the base.

The food of the Virginia rail consists largely of water inhabiting forms such as worms, insects, slugs, snails, small fish and the like. The long slightly decurved bill is admirably fitted for probing in the soft mud and ooze where the larvae of aquatic insects and other animals abound.

Probably one reason for the abundance of this rail may be its feeble and wavering flight, which to most sportsmen offers little opportunity for display of shooting skill.

Upper parts fuscous or black, the wing-coverts rufous. Cheeks gray. Throat white; rest of under parts rich brown. Bill decurved, bright red with base and tip dusky. Legs and feet dull reddish. Iris red.

Sora. *Porzana carolina* (Linnaeus).

Although the sora is the best known and most generally distributed of the North American rails and is said by Eaton (1910, p. 277) to be the most abundant species of rail in New York State, I found it to be much less common and more limited in distribution in the Oneida Lake region than was the Virginia rail. Perhaps the popularity of the sora as a game bird together with, in many places, the draining or filling in of its favorite haunts have tended to reduce its numbers considerably within the last twenty years. Possibly, too, the larger marshes prove

more attractive to this rail for in the Montezuma marsh Saunders (1926, p. 429) found the sora fairly common, though in most places not as common as the Virginia rail; ordinarily, according to his statement, two or three Virginia rails would be found to one sora. My experience in the Oneida Lake region indicates that the discrepancy in numbers between the two species is very much more marked, with the balance overwhelmingly in the favor of the Virginia rail.

In fact during the 1928 season I did not come upon a single sora although I visited numerous cat-tail marshes and swamps in different parts of the territory. It was not until June 14, 1929, in the extensive cat-tail marsh one and one-half miles southwest of Clay, that I first saw the species here. On that occasion two adult birds were observed among the cat-tails and arrow arum in the same habitat as that frequented by the Virginia rail and the Florida gallinule. At that time the water in the swamp was lower than usual, so that extensive mud flats and floating islands occurred at frequent intervals. Such conditions apparently appeal more to the sora than do the more moist conditions where the Virginia rail is commonly found. A few days later it was heard twice in the same marsh. Several visits had been made to this marsh in the summer of 1928, and subsequent visits were made to it during the 1929 season and, while the Virginia rail was recorded as common here and was observed a number of times at other marshes, these two stand as my only records for the sora in this vicinity. However, if more exhaustive searches were made one might possibly find this shy little rail somewhat commoner and more generally distributed than my records suggest.

The first spring migrants may be expected here about mid-April, although an early individual may be seen a month or more before that time. During early autumn the species is commonest here for then the local summer residents have been joined by arrivals from farther north. A frost in late September or early October will send them on their way to winter quarters in the Southern States and southward to the Bahamas and Central and South America.

One of the interesting characteristics of this species is the extended migration flights that some individuals undertake. As we see the birds awkwardly and laboriously flapping with dangling legs just above the tops of the cat-tails it is difficult to realize that they are capable of making successfully a one-way migration journey of more than 3,000 miles, part of which is over water where neither food nor rest can be had. It flies to Bermuda in numbers, and probably also crosses the Gulf of Mexico—necessarily in a single flight.

Both the sora and the Virginia rail occur and breed in the same marsh, but the sora is more shy and does not venture in the open so much. Possibly that is one reason why it is less frequently seen than the Virginia. Once in the open, a slight disturbance will send it scurrying into the shelter of the cat-tails, with head lowered, neck outstretched and wings and plumage closely appressed to the body. The appellation "thin as a rail" is suggestive of the lean and laterally compressed bodies of this and other rails. Unlike the Virginia rail the sora is not likely to show itself again soon after it has been frightened.

As with other rails, the sora exhibits little tendency to fly while in the marshes but moves about mostly by walking or running. It is said to dive and swim well.

When undisturbed it leaves the cover of the vegetation and steps about lightly, spreads its short, upturned tail at intervals and nods its head back and forth as it searches for food. Now and then it pecks at the surface of the mud or water but it does not probe as does the Virginia rail. Its long toes and small light body permit it to walk easily over floating vegetation.

The sora is a bird of solitary habits; seldom does one see more than a single adult in a small area. In the marshes it exercises its vocal powers less often and volubly than the Virginia rail. Near at hand, at least, its note is louder, harsher and more resonant than that of the Virginia. To me it sounds something like "ker-wee". The so-called "whinny" of the sora rail has been described as consisting "of a dozen or fifteen short whistles as sweet and clear in tone as a silver bell, the first 8 or 10 uttered very rapidly in an evenly descending scale, the remaining ones more deliberately and in a uniform key. The whole series is often followed by a varying number of harsher, more drawling notes given at rather wide intervals." (Brewster, 1902, p. 48.)

The sora builds its nest of reeds and grasses on the marsh vegetation a short distance above the level of the water. From ten to twelve eggs make up the average set; they are some shade of buff irregularly marked with darker shades. Sadler (1926, p. 6) records a nest with six eggs in the Westcott Street swamp on May 28, 1921. This swamp lies toward the southeastern limits of the city of Syracuse. Five days after its discovery the nest was empty. It is probable that the eggs hatched successfully and that the young had left, for they are extremely precocial and can walk and even swim immediately upon issuing from the egg.

During the summer the food of the sora consists of small aquatic forms such as mollusks, insects, tadpoles, worms and the like, supplemented to some extent by vegetable substance. With the ripening of the seeds of aquatic plants the bird turns its attention to these, and on arriving at the large marshes in the coastal states on its southward migration, the seeds of wild rice (*Zizania*) are said by Bent (1926, p. 308) to form its principal item of diet.

In an economic way this bird is probably of some value in destroying insects. Some sportsmen consider it a game bird. However, owing to the extraordinary slaughter which has been inflicted on the sora its numbers have greatly diminished and hunting of it is no longer so successful as it was in days past when bag limits were unknown.

Slightly smaller than the Virginia rail; upper parts olive-brown; scapulars streaked with white. Front part of head, chin and throat black. Breast and sides of head and neck bluish gray. Belly and under tail-coverts white. Bill short, yellow.

Florida Gallinule. *Gallinula chloropus cachinnans* Bangs.

I found this interesting but retiring and noisy marsh bird in numbers in but one locality in the Oneida Lake region, namely, in the great expanse of cat-tails in the Cicero Swamp south of Clay. Here the Florida gallinule, like the Virginia rail, breeds in apparent abundance.

Spring arrivals of this species may be expected in the Oneida Lake region during the latter half of April. On May 2, 1929, it was already common in the



Fig. 183. Nesting site of eastern sparrow hawk; dead stub of maple tree. Oakland Beach, fifty yards from shore of Oneida Lake. June 30, 1928.



Fig. 184. Young eastern sparrow hawks. Nest in maple tree at Oakland Beach. June 30, 1928.



Fig. 185. Nest and eggs of ring-necked pheasant in hay field. Muskrat Bay district. July 18, 1928.



Fig. 186. Young pectoral sandpiper at Sylvan Beach. May 16, 1928.

Cicero Swamp and apparently preparing to nest. In October the birds leave again for the South—often not before their numbers have been considerably depleted by gunners who consider the “water chicken”, “mud hen” or “red-billed mud hen” fair “game” even though its flesh is not always eaten. Its winter home extends from South Carolina through Georgia and Florida to South America.

The nest of the Florida gallinule is usually constructed amid tall flags and marsh grass. It is a bulky affair composed of rushes and dead stems and leaves of swamp vegetation. Often it is a floating affair and usually wet and soggy or at least very moist. According to Bent (1926, p. 350), the number of eggs in a clutch varies from six to seventeen, “both of which extremes are unusual; probably 10 or a dozen would be nearly the average number: the smaller sets are often incomplete.” Their color varies but some shade of buff or brown predominates; this is irregularly marked with darker spots or dots. The incubation period probably begins with the laying of the first egg and is said to last for about twenty-one days. Sadler (1926, p. 6) records nests with eggs at Onondaga Lake on June 17 and 27, 1916.

Although on several occasions during the early summer I visited the marsh when these birds were breeding, I was unable to search much for nests or eggs owing to the physical difficulties encountered in penetrating far into its recesses. Consequently it was not until July 2 that I was able to say with certainty that this gallinule nested here. On that date, I saw an adult bird, accompanied by six or eight downy black young about the size of three-weeks-old chicks, scuttle across an open place among the cat-tails.

Most of the marshes in the vicinity of Oneida Lake are comparatively small and more or less surrounded by woodland, so that the expansive cat-tail growth south of Clay is about the only one in the region which meets the requirements of the Florida gallinule. It consists, perhaps of fifty to sixty acres which at this point contains, in addition to cat-tails, a dense growth of arrow arum, swamp loosestrife and low willows. Among these are numerous pools and ponds of open water two to ten or more feet in depth. Mud Creek (Fig. 169) intersects the swamp from east to west and its sluggish brown waters spread over a considerable extent, for there are no confining banks here. Its surface is covered in most places with a layer of duckweed. There are few really dry places in the swamp, but here and there muskrat houses rise above the floor of the marsh and old trails lead off into the waving cat-tails. The tracks of the Rome, Watertown and Ogdensburg railroad traverse the swamp in a northeast-southwest direction. The road has been built above the surroundings so that the right of way serves as an excellent vantage point from which to view the bird life among the flags. Gently sloping, grassy banks, in some places more or less wooded, border both the north and south sides of the marsh. Trains pass over the railroad at frequent intervals and the usual farmyard noises can be plainly heard from the houses, barns and fields not far away. Such in brief is the setting in which the Florida gallinule and the Virginia rail are found here.

A flat-bottomed boat afforded me limited facilities for penetrating the marsh from a point where the railroad crosses Mud Creek.

The raucous "cuck" of the gallinule can be heard long before the observer arrives close enough to distinguish any of the skulkers among the flags; but presently a dark body bearing a brilliant scarlet bill and frontal shield swims across a little pool or runs hurriedly through the thick moist growth and if the watcher remains quiet and in one spot he may catch a glimpse of still others in the dark recesses of the undergrowth.

A field note made on July 6, 1928, relating to the habits and occurrence of the Florida gallinule in this marsh may be of interest.

"Saw only one downy black young today but heard many adults and other young calling. This is a very common species in the marsh. Several local residents have told me that particularly in early spring and again in autumn the bird is to be found here in large numbers. The track-walker for this section of the Rome, Watertown and Ogdensburg railroad tells me that adults of the species are frequently killed by passing trains and that he finds a greater number of bodies of this species on the stretch of track through the marsh than of any other. This circumstance is probably due to their tardy 'get-away' as well as to their comparatively slow flight".

This bird possesses a variety of calls ranging from a single coarse "keough" to a series of such keoughs, kaws, and kaks, variously modulated, accentuated and timed, and frequently lead the watcher to feel that the birds are laughing at his labored endeavors to view them and their activities. As a matter of fact the gallinules are more shy and retiring than the Virginia rails.

Under date of July 11, 1928, I wrote as follows concerning a visit to this marsh.

"Saw several adults and young of the Florida gallinule. The young were in the black plumage, with red bill and appeared to be about half grown. They were running about everywhere through the cat-tails. These birds, more wary than the Virginia rail, keep to the larger open places and bodies of water in the marsh, but their notes can be heard on all sides."

And again under date of July 17, 1928, I have the following note: "Common in the swamp. Mrs. Stoner saw an adult with three downy black young. I saw one bird of the year almost full grown and with *yellowish* bill. Evidently two broods are reared here in a season. The birds can be heard 'laughing' all through the swamp. Sometimes, when one has looked in vain for a bird to appear at a spot from which the voice seems to have come, and moves to seek what he hopes will be a better vantage point, he hears a derisive, laughing '*kr-r-r-r-r, kruc-kruc, krar-r; kh-kh-kh-kh-kea-kea*' delivered rapidly and falling in pitch toward the close; and then begins to wonder if the birds are not making merry over his more or less futile efforts to view them. The notes are vigorously delivered and are more or less hen-like in general character. However, these vocal efforts are subject to much variation.

Early in August considerable diminution in vocal efforts is apparent.

Another note written on August 7, 1929, relates to observations made in Cicero Swamp. "Young of the year are now as large as the adults. They sometimes stand motionless in the sun at the edge of the cat-tail thickets, for

as much as an hour at a time. Saw one bird apparently picking insects off the leaves of an arrow arum plant growing at the edge of Mud Creek."

The only other place where I have noted the Florida gallinule in the region was in a cat-tail marsh northwest of Hall Island, about four miles southwest of Lower South Bay. Although this marsh is but little more than an acre in extent it is not unlikely that the bird breeds here. It is probable that this gallinule occurs also in other outlying cat-tail marshes in the territory.

Although its feet are neither webbed nor lobed the Florida gallinule is an easy, graceful swimmer. It accompanies its swimming motions with a bobbing movement of the head. The front part of the body rests low in the water while the posterior part is buoyed up so that the white feathers partly covering the under side of the tail, which is habitually carried more or less erect, show conspicuously. The bird also frequently dives for food, as it does to escape danger. When disturbed it often lies with the body immersed and only the head and bill visible.

On its breeding grounds, at least, its preferred method of locomotion is walking or running. It is speedy and adept at picking its way through the dense marsh growth. Its extraordinarily long toes serve to bear it up while walking or running across floating aquatic vegetation.

The extensive migration journeys undertaken by this species suggest considerable powers of flight and when once under way it travels with speed and in a rather direct course. However, in its breeding quarters it flushes with difficulty and when pressed usually attempts to escape by running. If it flies it barely rises above the tops of the cat-tails, with a feeble and labored flapping of wings, the legs dangling from the body as though about to become disjointed. Its flight is short, the bird usually soon dropping into the rushes and depending upon its running, swimming and diving ability to carry it to safety.

The food of this gallinule "consists of seeds, roots and soft parts of succulent water plants, snails and other small mollusks, grasshoppers and various other insects, and worms." (Bent, *loc. cit.*, p. 352.) As indicated above in my notes of August 7, the bird picks up its food with quick strokes of the bill, in mud or water or on vegetation. The Florida gallinule is scarcely of any economic importance here, except possibly as a game bird.

Head, neck, upper and under parts dark bluish slate color, the back and scapulars washed with olive-brown. Belly whitish. Frontal plate, most of bill and a ring around the tibia bright red. Tarsis and toes greenish. Flanks streaked with white; lateral under tail-coverts white.

American Coot. *Fulica americana americana* Gmelin.

Most of these birds have passed on northward by May 1, the date on which my observations in the Oneida Lake region formally began. However, I have observed the coot a few times in early May in the Short Point and Nicholson Point districts, and on May 29, 1928, I saw in Shaw Bay eight individuals not far off shore. I had expected to find the bird in the open water of the cat-tail marsh one and one-half miles southwest of Clay but I am not sure that it breeds there. Saunders (1926) did not find it breeding in the Montezuma marshes but

reports that it formerly bred there in small numbers. However, he does record it as breeding at Onondaga Lake near Syracuse and I suspect that it nests in the marsh near Clay. That is the most likely nesting habitat in the Oneida Lake region, and its near relative, the Florida gallinule, as we have seen, breeds there in some numbers.

The coot usually arrives from the South in early April, although Sadler (1926, p. 6) gives the earliest date seen as March 14, 1925, at Nine Mile Creek, which flows into the south side of Onondaga Lake. By mid-May the birds have departed for more northerly breeding grounds, except a few that may remain over in suitable localities. This bird seems locally to fluctuate considerably in numbers from year to year. The autumnal movement becomes apparent about September 15 and continues for some weeks. It is during this season that the species is likely to appear here in greatest numbers. During the winter season vast numbers of these birds may be found about the mud flats and marshes of Florida, and in late December I have counted over 300 of them on a small expanse of mud beach in a marsh near Gainesville. At a little distance they look like huge lumps of earth as they bask in the sunshine.

The coot is a gregarious bird both in feeding and nesting habits. It is most likely to be found in marshes where patches of open water surrounded by reeds and flags are present. Both as a swimmer and a diver the bird excels. I shall not easily forget a sight I once enjoyed on the Iowa River, near Iowa City, Iowa, of more than 100 of these birds swimming along gracefully, with a forward and backward movement of the head accompanying the strokes of the feet, their whitish bills standing out clearly against the slate-colored bodies and the greenish waters of the river.

In seeking safety the first impulse of the coot is to swim away, but if pressed closely it rises and patters along on top of the water with rapidly vibrating wings until it attains sufficient momentum to fly. Flight then is labored and at a low elevation, the legs and large lobed feet stretched out behind, extending beyond the short tail.

During migration the coot is usually silent save for a low "*kuck*," but in the marshes and where numbers of them are congregated it often utters a series of cacklings. A chorus of such cacklings seems to serve as a warning, for the birds then scurry to cover or to deeper water.

The nest of the coot consists of a platform of reeds and dead vegetation built up in shallow water and concealed by the surrounding vegetation. The eggs vary in number from eight to fifteen. One may expect to find downy young here in late June. They are able to swim within a few minutes after hatching. They are also expert divers and can remain under water for a remarkably long time. "In two instances youngsters not more than a day old were observed to remain under water nearly three minutes, as timed by a watch." (Grinnell, Bryant and Storer, 1918, p. 317.)

The food of the coot consists of a varied assortment of leaves, stems, seeds and roots of aquatic and semi-aquatic plants, small fishes, tadpoles, mollusks, worms and aquatic insects and their larvae. "Most of its food is obtained on, under, or near the water of its marshy haunts; but it is no uncommon sight

to see it walking about on the marshy shores or even on dry land picking up its food in a lively fashion after the manner of domestic fowl." (Bent, 1926, p. 362.)

This bird is widely known and it has acquired a variety of colloquial names throughout its range. Most of these are more or less descriptive of certain of its activities, habits or structural characters. Among them are mud hen, meadow hen, water hen, white-bellied mud hen, crow bill, crow duck, hen bill, blue Peter and Chinese mallard.

ORDER CHARADRIIFORMES

PLOVERS, TURNSTONES AND SURF-BIRDS: FAMILY CHARADRIIDAE

Semipalmated Plover. *Charadrius semipalmatus* Bonaparte.

This trim little plover occurs about Oneida Lake in both spring and fall but appears to be most common in late summer. Since it is almost entirely a beach bird the number of places about the lake that appeal to it is rather limited. My earliest spring record is May 31 when I saw a flock of fourteen on the narrow sand beach at Delmarter Bay, a little more than a mile southeast of Shackelton Point. When I first saw the group, the birds were running about on the beach, stopping for a moment to feed, then running on rapidly again with heads high in true plover fashion. They were very wary and on my approach took flight in a compact body, the members flying close to the water, wheeling together now this way now that, or winging along in straight flight. Within a short time they returned and began running about in characteristic fashion, often pausing abruptly and bobbing their heads or pecking or probing for food.

Sylvan and Verona beaches are the points about the lake where this plover was found most frequently in late summer, although I have never seen more than a dozen birds there at any one time. On August 13, 1928, I found about ten birds, both adults and immature, in company with sandpipers at Verona Beach. Several times I saw them probing rapidly up and down, after the manner of sandpipers, in the moist sand of the beach. They were also feeding on dead minnows and other small fish in the beach drift.

At Wantry Island, too, I have found this plover. On July 19, 1928, when I first arrived on the island, an adult and three immature birds were on the narrow sandy beach, mingling freely with the spotted and other sandpipers. However, here as elsewhere I found them very wary, and after they had been disturbed a few times flew away and did not return. On two subsequent visits to the island in August I found none.

With reference to this species in the Syracuse region, Sadler (1926, p. 7) says: "Seldom seen in spring. Ten were seen May 28, 1915, near Onondaga Lake. A few are seen in that vicinity every autumn from the third week in July to the last of September." Dr. C. E. Johnson saw two semipalmated plovers in company with two least sandpipers and a spotted sandpiper at Sylvan Beach on April 17, 1928, and four among semipalmated sandpipers on September 7, 1927. The records show that this bird is commoner along the coast than on the inland waters of the State.

The semipalmated plover breeds from Labrador west to British Columbia and north to the Arctic, and winters from southern United States to South Amer-

ica. My earliest summer record is July 15, 1929, when I saw a single bird at Verona Beach along with killdeers and semipalmated, least and spotted sandpipers. This bird was very wary and would not permit close approach. After the middle of July individuals from the north keep coming in, and by the latter part of August the species is represented in some numbers. The post-breeding movement southward appears to be much more leisurely than the northward movement in spring.

Moist sand beaches such as those at Verona and Sylvan beaches are favorite feeding grounds of the ring-necked plover. Here its brownish gray upper parts and white under parts, with a single black band on the upper breast, blend in so well with its surroundings that, unless the bird is in motion it is rather difficult to see. Although they mingle with other birds while feeding, the ring-necks ordinarily keep by themselves in flight; if one takes off the others that may be feeding in the immediate vicinity will usually follow, leaving behind any sandpipers that may have been among them.

"The common call note is a clear, rather plaintive, whistle of two notes, very distinctive and frequently emitted while the birds are on the wing." (Bent, 1929, p. 223.) It has been written as "*chee-wee*" and "*tyoo-cep*."

The semipalmated plover has no very evident economic status, and cannot be fairly rated as a game bird. Its æsthetic value is, however, sufficient to warrant its permanent protection.

Killdeer. *Oxyechus vociferus vociferus* (Linnaeus).

Probably the killdeer is the best known of the North American shore birds. It has a tendency to wander far from water into meadows, pastures and cultivated fields and its loud and expressive "*kill-dee, kill-dee*" serves always to advertise its presence.

In the Oneida Lake region the killdeer is a common summer resident, arriving in March and leaving late in October or in November. From November 1 to March 1 the killdeer is one of the most common species of birds invading the celery fields of central Florida, where it feeds freely upon several forms of exceedingly destructive insects. I have frequently seen flocks of 200 to 300 individuals feeding in such situations. It seems likely that many of the first spring arrivals about Oneida Lake pass on north to breed, while those that reach this territory later in the season are the ones that remain to nest. About August 1 the local birds are no doubt joined by the vanguard of migrants from the North, so that throughout this month the local abundance of the killdeer is at its maximum. It is at this time also, that the bird is most abundant in the immediate vicinity of the lake shores. Throughout the summer months it is one of the most generally distributed, though not abundant, birds in the region.

As might be expected, this plover is somewhat commoner in the open meadows and fields of the flat country south of Oneida Lake than in the hilly and more wooded territory north of Cleveland, Jewell and North Bay. However, also in the more wooded areas this active, noisy bird is likely to be found in situations where grassy clearings or cultivated fields exist, such for example as in the Vandercamp woods and in the Gordon Pond and Shaw Point districts. On June 7,

1929, in the open, hilly, plowed fields on the south side of Panther Lake, several killdeer were seen, and I believe that the species nests here. The expansive open fields and meadows found so generally in the Fish Creek Landing district as well as in the Lakeport, Bridgeport, Lower South Bay, Short Point, Clay and West Monroe districts are favorite resorts.

After mid-summer, the killdeer largely deserts the open fields and assembles on the sand beaches such as at the east end of Oneida Lake, where it occurs in company with several kinds of sandpipers and the semipalmated plover. Many young killdeer of the year are now included. Of these beach birds, the killdeer is the noisiest and wariest as well as the swiftest runner: its plaintive "*kill-dee, kill-dee*" is heard not only between feeding intervals as it runs along the shore but also as it flies overhead in small flocks, a characteristic more marked at this season of the year than at any other. From mid-July to the time of our leaving the region we found it also at Delmarter Bay, Fish Creek (Fig. 145) and at other places where exposed sand beaches occur. Toward mid-August its abundance diminished somewhat. It seems that after the young are able to fly well they repair with the adults to the beaches, in numbers, where they feed for a time, then gradually disperse into the fields and outlying marshes and finally depart for the season. In the latter part of the summer the birds also congregate locally in small flocks on the mud flats in the Cicero swamp south of Clay. Here they feed and chatter away to their hearts' content even though at times they are made the objects of attack by the belligerent red-winged blackbirds. Earlier in the season they evidently breed in the cultivated fields adjoining the swamp.

Both Long Island and Wanry Island are visited occasionally by the killdeer, where it associates with other shore birds and terns. In proportion to its local abundance the killdeer is not so common on the islands as the spotted sandpiper or as the least or the semipalmated sandpiper. In the restricted areas of the islands I saw no display by the killdeer of any belligerent qualities toward their associates, but contrary to most of the other shore birds the wary killdeer usually left the islands soon after my arrival on the scene.

During the 1929 season the killdeer appeared much less common than in the preceding summer. Even in May we seldom saw more than two or three birds in an entire morning.

While the killdeer has a great variety of cries, the killdee note is the one from which the common name is derived. Indeed, in the Southern states this bird is more commonly known by the name "killdee" than by the term "killdeer." Not infrequently the killdee notes are succeeded by a lively chatter such as "*dee-dee-dee*" or "*tsee-he, tsee-hee*" repeated several times; and at other times the typical killdee note is preceded by this rapidly repeated series. The vocal performances of the killdeer are continued without much diminution throughout the summer.

The killdeer is a very rapid runner and shows the usual plover characteristics when feeding: running for a short distance, then coming to a full stop, with head erect, or perhaps pecking at the ground; then it runs on again for a distance and repeats the performance. Like many other species of shore birds it has a

habit of bobbing the head and of teetering the body in a nervous manner, especially when it is alarmed.

Preceding the breeding season proper, the killdeer often indulges in courtship performances of various kinds. Several types of aerial acrobatics are said to be undertaken in which the bird skims along close to the ground, calling loudly; or it mounts to a great height and falls rapidly for some distance before catching itself on outstretched wings. Various struttings and plumage displays also are gone through by the males.

This plover usually nests in "pastures, meadows, cultivated fields and bare gravelly ground" (Bent, 1929, p. 205). Sometimes the immediate vicinity of human habitations is chosen as a site by a nesting pair. The proximity of water seems to make little difference. Potato patches and corn fields are apparently favorite nesting sites. Ordinarily its nest is simply a concavity in the soil and in which a few blades of grass, weed stalks or other vegetation have been placed. Sadler (1926, p. 7), records a nest with eggs near the Westcott Street swamp on June 6, 1921. This place is within the city limits of Syracuse; three days later the nest was empty. This observer also records a nest at Constantia on May 16, 1925, and says that "the next morning the young were found running around with their parent."

Four eggs usually comprise a set. They vary in color, some shade of buffy predominating as a ground color upon which are irregular marks of brownish. According to the observations of numerous writers (Bent, *loc. cit.*, p. 207), the period of incubation may vary from twenty-four to twenty-eight days. Both sexes take part in this duty. During the period of incubation and while the young are small the adults are very wary and adopt the well-known broken-wing and other ruses to divert attention from the eggs or the young to themselves. The young are highly precocial and the coloration of their plumage blends in so well with the surroundings that when they remain motionless, as they often do if danger threatens, their detection is difficult.

On June 22, 1928, a pair of killdeers had a nest with eggs in Mr. C. Shaw's potato patch at Shaw Point. This nesting site was about 100 yards from the shore of Oneida Lake.

On June 29, 1929, in an open plowed field on the west side of Chittenango Creek, near its mouth, I flushed a pair of killdeers, and although I searched diligently for the nest without finding it, I am quite sure that there was one in the vicinity. Likewise on June 22, 1929, at Hitchcock Point and again a few days later south of Bridgeport, I am confident killdeers were nesting although I failed to find the nests.

It may be safely stated, therefore, that the killdeer is a fairly common breeding bird in the Oneida Lake territory and that eggs in the nest may be looked for in late May and well through June. Birds of the year able to fly were recorded from the Sylvan Beach district early in July.

Since the killdeer spends much time in and about cultivated fields its food habits have an important economic bearing. The investigations of McAtee and Beal (1912) reveal that "97.72 per cent of the killdeer's food is composed of insects and other animal matter." (*Loc. cit.*, p. 18.) Many of these insects are

troublesome or injurious. The following principal items were found to comprise the larger share of its diet: Beetles, 37.06 per cent; two-winged flies, 11.91 per cent; miscellaneous insects, including grasshoppers, caterpillars, ants, bugs, caddisflies and dragonflies, about 28 per cent; a varied assortment of small invertebrate forms such as spiders, earthworms, snails, crabs and the like constituted a little more than 21 per cent of the total amount of food taken.

In this territory I have sometimes observed the killdeer feeding in open cut-over meadows along with red-winged blackbirds and bronzed grackles.

The attractiveness and the economic value of the killdeer give it important rank among our birds. Before it was given the legal protection it now enjoys its numbers had been much reduced in some parts of the country by hunting.

The voice and the usual plover habits sufficiently characterize this bird. In addition, the pale rufous rump and upper tail-coverts and two black bands, one on the lower neck, the other on the upper breast, are good field marks.

Ruddy Turnstone. *Arenaria interpres morinella* (Linnaeus).

I had the good fortune to come upon a single example of this uncommon and irregular—so far as inland New York State is concerned—species of bird on the morning of August 6, 1929, toward the south end of Verona Beach, at the east shore of Oneida Lake. The bird was in winter plumage, so that the variegated chestnut, black and white of the upper parts of the typical summer plumage were lacking, having been replaced by the more somber brown and gray. However, the pied black and white neck and fore-breast, the white tail with broad sub-terminal band of black and narrow apical white one, together with the black bill and orange-red legs and feet afforded sufficient distinctive characters at this season to leave no room for doubt concerning the identity of this unique species.

This individual, in company with a semipalmated plover, was exploring the sandy beach near the edge of the water. It did not enter the fish- and débris-strewn expanse of beach exposed by the low stage of the water of the lake at this season. It was probing in the fine moist sand, but was wary and ran along the beach ahead of me as I approached it, not permitting me to come closer than about twenty yards before taking wing.

While the ruddy turnstone is recorded by Eaton (1910, p. 358) as a common transient on the east coast of New York, it is not of frequent occurrence in the the interior parts of the State. On the coast it arrives during the first half of May and by mid-June has passed northward to the Hudson Bay and Mackenzie delta regions. The first returning individuals are likely to appear late in July, and all have departed for their winter home in the Gulf States and South America by early October.

The Sylvan Beach district is the only locality in the territory that would appeal much to this bird, which evidently occurs here but infrequently and irregularly.

The turnstone is essentially a beach bird, and along salt water beaches frequently occurs in great flocks. Bent (1929, p. 279) mentions flocks of 3,600 to 7,000 on the New Jersey coast. In the interior districts it is likely to occur only

singly or in pairs, or possibly in small groups, and in company with other species of shore birds.

The common name "turnstone" refers to the characteristic habit of the species of turning over with its short, plover-like bill, stones, shells, lumps of earth and fragments of beach débris in its search for small crustaceans, mollusks, insects and their larvae which form the bulk of its food. "If the object is not too large the bird stoops down and overturns it with a quick jerk of the head and neck; but against a larger obstacle it places its breast and pushes with all its strength; it is surprising to see how large a stone or clod it can move. It also has a peculiar habit of rooting like a pig in piles of seaweed or in the open sand." (Bent, *loc. cit.*, p. 286.)

Observers should be on the lookout for this distinctively marked shore bird which possibly may occur more commonly in the interior of the State than the available records indicate.

WOODCOCK, SNIPE AND SANDPIPERS: FAMILY SCOLOPACIDAE

American Woodcock. *Philohela minor* (Gmelin).

This odd and interesting bird is a summer resident of more or less general and frequent occurrence in the Oneida Lake region. However, from reports of local gunners and others I judge that in recent years its numbers have become considerably depleted here as its breeding places have been encroached upon by clearings, cultivation and other improvements of man.

During the 1928 season I came upon woodcock on five different occasions between May 3 and July 30. It is possible that two of these records refer to the same bird since the species was seen twice within a period of twelve days in the woods on the south side of the mouth of Chittenango Creek. Other localities where I saw the woodcock are the Shaw Point district, a wooded tract three miles south of Bridgeport, and a low, swampy thicket near the edge of Oneida Lake at Baker Point. My records for the 1929 season are as follows:

"May 7. Flushed one bird in the low, boggy hardwoods sixty yards south of the Syracuse Yacht and Country Club golf course.

"June 15. Flushed one bird from beneath a small red-osier dogwood bush which was growing in a shallow drainage ditch 100 yards southwest of the trolley station at Lower South Bay. This bird was perhaps five yards from the tracks of the electric railway over which cars passed at more or less frequent intervals, and about 100 yards from a much traveled automobile highway. That the bird should be met with so close to all these activities was somewhat of a surprise. Evidently it was feeding in the soft mud of the ditch bottom, for on inspecting this ground I found a considerable number of the characteristic borings.

"June 29. Flushed three birds in the course of a twenty-minute walk through a grassy willow and red-osier dogwood marsh on Hitchcock Point, between Froher Bay and Chittenango Creek. Mr. Jones, a camper at Hitchcock Point, told me that he had flushed a woodcock from a willow thicket there about June 20.

"July 8. Flushed two woodcocks from a low, boggy alder-maple-birch sapling thicket which borders the margin of a wooded ridge extending through the

swamp a half-mile west of Short Point. The birds were not together but within a few rods of each other.

"July 12. Flushed a woodcock in a small woodlot a mile southwest of Shackelton Point. Tall maples, elms and ashes grew here and beneath them a moderate amount of undergrowth. The ground was well shaded, but at this season not very moist. Cultivated fields closely surrounded the unpastured woodlot in which this bird had found a retreat."

In addition to the localities above listed I was told that the woodcock occurs locally in a dense cedar bog one and one-half miles northwest of Vienna; and Mr. Torrey Steenburg, gamekeeper for Mr. F. C. Soule, informs me that the bird is seen now and then in the Vandercamp woods. No doubt this "owl among snipe" is to be found sparingly in most of the woodlands of this region. I have never met with more than a single bird at any one spot, although on two occasions I have flushed individuals within a few rods of one another.

That the woodcock breeds in this locality is established by Mrs. Stoner's finding on May 15, 1928, of a nest containing four eggs. The nest was in hardwoods, mostly maple, growing in the low, flat area 100 yards south of the mouth of Chittenango Creek. It was on the ground, partly concealed and protected by the dead limb of a tree that had fallen here, and was a rather substantial structure composed of dry leaves. The bird apparently did not return to the nest after it was first flushed and the eggs finally disappeared. The woodland three miles south of Bridgeport, where a woodcock was flushed on July 20, 1928, also offers suitable nesting conditions. The species probably breeds in many of the unpastured timbered tracts of the region.

In New York it is said that fifty years ago the woodcock nested in every county of the State; but its breeding places have now become so restricted through clearing, drainage and cultivation and its numbers have been so reduced through undue killing by hunters and enemies of one kind or another, that some apprehension is felt regarding its ultimate fate. In this connection Eaton (1910, p. 298) says: "I have little doubt that in the State as a whole we have no more than one woodcock where there were 50 in 1860." Residents about Oneida Lake recognize the fact that the bird is decreasing in numbers and many of them believe that it should be protected for a period of years in order to regain something of its former status.

This bird is an early migrant and summer resident that may be expected in the Oneida Lake region any time during the first two weeks of March and even in late February. The last fall birds are commonly seen in early November, though an occasional straggler may remain later.

In summer I have always found the woodcock in low although not always wooded bottom lands. While in the main it is nocturnal both in its migratory movements and feeding habits, I have several times found fresh borings which indicate that the bird is perhaps more diurnal than we are sometimes led to believe. "During the day the woodcock sits quietly amid its coverts, or stands sleepily at the edge of the swamp, or beside some path or opening in the woods, his head drawn down upon his 'shoulders' and his bill pointing downward, appearing more like a ball of brown leaves attached to a slender stick, than like a bird. If dis-

turbed he pops up, as if discharged from a catapult, to the tops of the bushes; then darts away in a horizontal course, and quickly drops again among the bushes. Its flight is rapid and accompanied by a whistling, whirring sound." (Eaton, *loc. cit.*, pp. 298-299.) In woodland it is somewhat weak, irregular and zig-zag, in the open more swift and direct, although usually over a short distance.

Under ordinary conditions the woodcock feeds upon earthworms, for which it probes with its long and highly sensitive bill; it has been known to eat more than its own weight of such fare within a period of twenty-four hours. In times of drought, insects—including ants and insect larvae—and slugs make up the bulk of its food.

The stout build, wood-brown general coloration, long bill and, when flushed, the whistling sound made by the broad, rapidly vibrating wings will serve to identify it.

Wilson's Snipe. *Capella delicata* (Ord).

Wilson's snipe, often called locally "English snipe," and less frequently "jack snipe" or "grass snipe," occurs fairly commonly in suitable situations in the Oneida Lake territory through the summer. I have seen the birds most frequently at a willow and alder swamp that extends away to the east in the South Bay district (Fig. 143), in the Shaw Point district, and over and about the Cicero Swamp one and one-half miles southwest of Clay. Other places where I have seen the bird less frequently are the North Bay, Coble Point and Big Bay districts, and the grassy margin of a maple-elm-cedar bog two and one-half miles southeast of Shackelton Point. On June 22, 1928, in an open, grassy marsh at Shaw Point I saw several individuals in the course of a half-hour's walk. It is thus evident that this bird is fairly generally distributed in the grassy bogs and marshes all about the lake. Most of my records are for May and June. After the middle of July the species is not often seen until after the autumnal migration begins in September. Sadler (1926, pp. 6-7) records this snipe "At the edge of Fish Creek near Verona Beach on July 22, 1922 . . ."

Considerable evidence is at hand to indicate that Wilson's snipe nests in the South Bay, Toad Harbor, Big Bay and Shaw Point districts. Several times in early May (in South Bay district) I have heard its long-continued "bleating" or "winnowing" aerial performances which are common in the nesting season. And I have heard and seen these even as late as July 2. Mr. Edward Nicholson, who lives near the lake shore about three-fourths of a mile east of Brewerton, told me that on May 28 he found a nest containing four eggs, in a grassy marsh near Toad Harbor. On June 17, in a grassy swale on the west side of Big Bay, I flushed an adult and two others which, from their size and actions, appeared to be young birds. An extensive grassy marsh along the lake here extends from the woodland at the head of Big Bay to Milton Point, a mile and a half northeast of Brewerton, and is a likely nesting place for the Wilson's snipe. Along the edges of Cicero Swamp southwest of Clay are extensive low-lying grassy marshes which afford suitable breeding conditions, and I have often heard and seen the aerial evolutions of the snipe in this district. Eaton (1910, p. 301) records the species as nesting in Onondaga and Oswego counties.

Many times during the spring movement, as well as throughout the nesting season, I have witnessed both by ear and by eye the remarkable courtship flight of Wilson's snipe. In my experience the bird usually flies in broad circles perhaps 500 feet above the marsh from which it has arisen. In circling about it rises and falls at intervals, the descents being rapid and sudden, the ascents more gradual. The sound, "*who, who, who, who, who, who, who, who,*" increases and decreases in intensity but is produced toward the end of a sudden descent in the air, the wings at that moment apparently flapping alternately. This sound has been termed "bleating" after its fancied resemblance to the bleating of a goat, and also "winnowing." The performance is likely to continue for from ten to thirty minutes, and I have observed it both morning and afternoon. Both sexes are said to perform these acrobatics. For a long time it was thought that this peculiar tremulous sound was produced by the rush of air through the wings, but many observers believe with Dawson as quoted by Bent (1927, p. 83), that "the body of the sound is produced by the impact of the air upon the sharp lateral feathers of the tail, held stiffly, while the pulsations of sound are produced by the wings."

This elusive, solitary inhabitant of grassy marshes is found throughout the State as a migrant and may be expected in spring soon after the frost is out of the ground. It is commonest from about April 15 to May 15. While it commonly breeds in more northern latitudes it occurs as a summer resident in many parts of the State, particularly in central New York, and breeds in suitable areas, of which the Oneida Lake region is one. Most of the northern breeding birds have left this region by May 15. The southward movement begins in September but the birds are likely to continue with us until freezing weather sets in.

Like the woodcock, which it resembles somewhat in habits and appearance, the Wilson's snipe probes into the mud and soft ground of grassy bogs for its food which consists largely of earthworms, insects and their larvae, as well as other lowly forms, mainly terrestrial and burrowing animals. The highly sensitive bill is thrust perpendicularly into the soil, and the upper mandible, being somewhat flexible toward the tip, can be moved independently of the lower one so that the bird is enabled to feel about below the surface. In its search for food it makes "borings" or "drillings" similar to those of the woodcock. Often a considerable number of these borings may be found in a small area, as I observed in the Coble Point district on July 16.

When attempting to evade an enemy this snipe crouches motionless in the grass, where its colors blend so well with the surroundings that it can be detected with difficulty. I have approached to within a few feet of a bird under these circumstances. If the danger becomes imminent a whirr of wings, a sharp "*scaipe, scaipe,*" and the snipe is off in an erratic, zig-zag flight during which the broad, subterminal, rufous band on the tail stands out as a prominent field character. Once under way the flight is swift and more direct though not very high. When moving from one locality to another the bird flies higher. On the evening of July 17, I saw a group of eight birds thus flying in loose formation above Cicero Swamp southwest of Clay.

Fifty years ago Wilson's snipe was a very abundant bird, but due to excessive shooting its numbers have been much depleted. It has always enjoyed great popularity as a game bird. Bent (*loc. cit.*, p. 92) gives some notion, both of the former abundance and of the slaughter of these birds in describing the hunting activities of one James J. Pringle. He says: "During the twenty years from 1867 to 1887 he (Pringle) shot, on his favorite hunting grounds in Louisiana, 69,087 snipe and a total of 71,859 of all game birds; but his shooting fell off during the next ten years for he increased his grand total of snipe to only 78,602 and of all game birds to only 82,101! His best day, undoubtedly a world's record, was December 11, 1877, when he shot in six hours 366 snipe and eight other birds."

Such excesses as these have been responsible, in recent years, for more stringent regulations regarding length of open season, bag limits, continuous closed season, the establishment and maintenance of Federal and State preserves, sanctuaries and breeding grounds as well as other legislation looking toward the perpetuation and well-being of this and other species of game birds.

Upland Plover. *Bartramia longicauda* (Bechstein).

The upland plover—which is not a plover at all but a sandpiper with plover-like habits—does not seem to be a common bird in the Oneida Lake region. However, it is of fairly general distribution. My earliest record for it is May 8, when one individual was seen on a grassy slope a mile west of the village of West Monroe. Its color blended in so well with the dried grass about it and even with the adjoining plowed ground that the bird was difficult to see. As we drove slowly along the highway the plover remained undisturbed, but when I attempted to approach it on foot it proved to be shy. When it alighted after its short flights it stretched its wings high over its back and held them there for a moment before closing them. Many of the larger sandpipers also exhibit this trait.

During the 1928 season I did not see another upland plover until August 9, when, in a recently cut hay-field, twenty yards from the main highway, about two miles northeast of the village of Cicero, I saw a single individual. When we attempted to follow this bird it eluded us, not by flying but by running; it then remained motionless in the hay-field and near-by cabbage patch where the buffy coloration of the plumage rendered its possessor quite inconspicuous against the background of dry grass stalks and earth. This locality is two miles from Oneida Lake. On August 15, I saw two birds in a meadow about five miles southwest of Lower South Bay. Dr. C. E. Johnson reported having seen a flock of six birds on August 14, near North Manlius. Evidently a more or less distinct movement of the species takes place here at this season.

In the 1929 season I did not come upon an upland plover until June 25, when a single bird was seen in an oats field on high ground and 100 yards from the lake shore, a mile east of Maple Bay. This bird, too, ran in attempting to escape the observer.

Several times during July I saw this plover, which often frequents cut-over hay-fields. I believe the species nested in a hummocky pasture a mile south of Lakeport but, although I searched for some time in the place where I flushed

a bird on July 11, I could find neither nests nor young birds. While I conducted the search, the highly excited adult flew about, alternating its position between a near-by fence post and the ground several rods away, all the while uttering its well-known "*quip-ip-ip-ip, quip-ip-ip-ip.*" On my first approach to the place the adult appeared greatly distressed and feigned lameness as it fluttered through the grass ahead of me, then suddenly mounted into the air.

The first spring migrants of this species are likely to appear in the Oneida Lake region toward the end of April, and the last ones usually depart early in September. The southward movement is usually preceded by gatherings into small flocks such as those recorded on August 14 and 15.

The upland plover, formerly known as the Bartramian sandpiper and sometimes called "field plover," was **once** very abundant in the open grassy areas throughout its range; but excessive shooting coupled with the elimination of breeding areas has greatly reduced its numbers. However, it seems to be "coming back" somewhat in recent years for it has adapted itself to nesting in cultivated or semicultivated fields. If it now can have complete protection from shooting it may, in time, regain at least some measure of its former status.

When flushed from its nesting place this plover flies with short, quick wing strokes as it utters its characteristic rolling trill; sometimes it soars or hovers above the intruder while it protests his presence vociferously, then flies away to alight on a fence post or telephone pole, there to continue its protestations. If not too hard pressed, it runs through the grass with its neck extended, looking behind it. When undisturbed it runs rapidly for a short distance, draws up suddenly, then runs on again much after the fashion of a killdeer. The proximity of water appears to be quite unimportant so far as the welfare of this quiet, unsociable inhabitant of the fields is concerned.

The nest of the upland plover is built on the ground, usually in the thick grass of meadows or old pastures where it is well concealed by hummocks or tufts of vegetation. Sometimes plowed fields are accepted as nesting sites. The nest proper is a cup-like depression lined with grass and plant stems. Four buffy eggs marked with darker brown comprise the ordinary clutch. They are most likely to be found between May 1 and June 15. Incubation is said to require seventeen days. The incubating bird sits close and is not flushed easily. Both sexes take part in incubation as well as in the care of the downy, precocial young. In the Oneida Lake territory, I believe that nesting birds are likely to be found in the West Monroe, Clay, Lakeport and Bridgeport districts.

This buffy brown bird has a slender neck and head, the latter more or less plover- or pigeon-like; a long tail, dark rump, and barred, whitish outer tail feathers. In flight the long, pointed wings carry the bird swiftly along but, except during migrations, the upland plover does not often make continuous flights of any great length.

Spotted Sandpiper. *Actitis macularia* (Linnaeus).

Owing to its abundance, wide distribution, peculiar and characteristic flight, method of walking and its distinctive note, the spotted sandpiper has become one of the best known of our North American birds. On account of its popularity

and general recognition, it has received a considerable number of local or colloquial names of which "tip-up," "teeter-tail" and "teeterer" are, in my experience, the ones most frequently heard. So far as individuality in manner and bearing is concerned the spotted sandpiper is not lacking.

In New York State, as well as in the Oneida Lake area, this is the most generally distributed representative of the family. A beach or island scene would not be complete without at least two or three of these teetering, plump-bodied sandpipers. Among the shore birds its closest rival in point of numbers is the semipalmated sandpiper. In the East, the winter range regularly extends north as far as the coast of South Carolina and south through the Antilles to Brazil, Bolivia and Peru. The first spring arrivals are likely to put in their appearance in the Oneida Lake region about April 15. Dr. C. E. Johnson records a single individual from Sylvan Beach on April 17, 1928. However, it is not until at least a month later that the species reaches its maximum of abundance here as its numbers are being augmented continually by new arrivals.

Throughout the summer the bird here inhabits the meadows, swamps, marshes and cultivated fields adjoining, as well as the shores and islands of Oneida Lake, and the tributary streams, and neighboring lakes and ponds, even those that are closely surrounded by woodland. The distribution and abundance of the bird locally at once impress the observer. On the whole, I should say that the spotted sandpiper is commoner in the more expansive open territory south of Oneida Lake than in the wooded sections about Cleveland, Jewell and North Bay. The autumnal movement occurs mainly in September but sometimes continues into October. For some time previous to the fall migration the birds, both adults and young of the year, congregate in numbers on the shores, beaches and islands of Oneida Lake where, along with their near relatives assembling there, they contribute to form a considerable part of the local shore bird population.

The spotted sandpiper is not strictly a gregarious bird although numbers may occur together where plenty of food, freedom from molestation or favorable nesting sites are found. Neither is it a particularly sociable bird for its belligerent tendencies prevent it from being a desirable associate of other shore birds, although it often occurs on the same beaches and islands with them. Throughout the summer the bird may be seen in almost any part of the territory under consideration, but it frequents especially the margins of the lake and its islands and the sandy beaches along Fish Creek. The bird is common on Frenchman Island, where it ranks next below the red-winged blackbird in point of abundance; it also breeds on this island. Although recorded from Dunham Island it is not so common there. It is on the low-lying, sandy and pebbly beaches like those of Wantray, Long and Dixon islands that this sandpiper finds its most congenial surroundings, these islands and the beaches at the east end of the lake and along Fish Creek being its principal gathering places. However, its presence is not confined strictly to such situations for it still retains an inclination to wander and to indulge its more or less solitary proclivities, so that one not infrequently comes across individuals in corn fields or meadows some distance from the lake or any other body of water. These conditions I have noted particularly

in the Shaw Point and Bernhard Bay districts, but they are not at all peculiar to those areas.

On June 15, 1928, in the Bernhard Bay district, several spotted sandpipers were observed in Mr. Taft's corn field which lay at least one-half mile from the lake. Again on July 5, I saw an adult and an immature bird together in a corn field one mile south of Lakeport and more than a mile from Oneida Lake. On July 20, in a corn field at the edge of Butternut Creek, in the North Manlius district, a pair of adults became very much disturbed at my presence, and I believe that young were in hiding here although I was unable to find them.

The spotted sandpiper can run rapidly but it often stalks stealthily through grass or other vegetation near the shore, picking off insects. When thus engaged its characteristic teetering movements are less pronounced. If alarmed it rises with rapid, powerful strokes of the cupped wings, accompanied by a whistled "*peet-weet-weet*," and sails out of the danger zone. That the bird includes swimming and diving among its accomplishments has been noted by numerous observers. And that its young unable to fly also can swim and dive with ease, and on occasion attempt to escape by this means, is attested by the observations of others as well as by my own here. In connection with this interesting habit I will insert now certain excerpts from my field notes—including also other items relating to the behavior and occurrence of the species on Wantry and Long islands.

"July 19, 1928. At Wantry Island the spotted sandpiper was represented in much greater numbers than any other bird on the island. Adults and young of the year, including five small birds still in the down and unable to fly, were seen. The presence of the latter shows that the species breeds here on the island.

"When I pursued these young they attempted to escape by hiding and remaining motionless among the small boulders. In this ruse they were more or less successful for the mottled brown, buff and black of the natal down blended well with the surroundings and to see the birds then was difficult. However, I started at one end of the island and, walking slowly toward the opposite end, drove all the birds before me. Some of the adults flew around and behind me but those that could not fly were driven before me. When closely pressed these latter took to the water, rather reluctantly it seemed to me, and chirping loudly but swimming vigorously, with wings moving simultaneously and the feet working rapidly. When I waded out to catch these young they dived and swam under water for some distance. I was obliged to reach down into the water to capture them. They were evidently all of one family.

"An injured adult bird unable to fly was tossed lightly into the air and it fell into the water. When I attempted to recover it, it tried to escape first by swimming. Then when I was about ready to grasp it the bird dove and swam with vigorous strokes of both wings and feet. It remained under water for several seconds, traversing a distance of about eight feet.

"July 24, 1928. At Wantry Island both adults and young were present, though not so abundant as on July 19. When I arrived on the island at 2:15 P. M. there were not more than twenty-five or thirty sandpipers of all kinds present. I captured one of the young birds that I had banded five days before.

It could just rise from the ground by means of its wings but could not fly, and when hard pressed, dove and swam under water for about ten feet, came to the surface and immediately dove again, swimming under water for some distance before I captured it.

"A bird of about the same age that I captured later at Long Island behaved in much the same manner. After diving and swimming under water for some distance, it rose to near the surface. A line of small bubbles appeared, suggesting that exhalation was taking place. The bird immediately dove again and swam with quick, strong wing strokes, but I noticed that it was tiring after its two successive under-water efforts."

At Long Island on August 8, 1928, I flushed a young spotted sandpiper from tall grass. It flew out over the water for about fifteen yards where it lit on the surface, swam a few strokes, then rose from the water without difficulty and flew back into the grass.

This aquatic familiarity and ability must be important survival factors for this bird.

This sandpiper is shy but not very suspicious. On Wantry Island as I sat in my low blind, one side of which was open so that I could be plainly seen by birds that approached from that direction, they often came within six or eight feet of me while I remained motionless. If I moved slowly and deliberately they were but little if at all frightened.

The spotted sandpiper is an inveterate bather. Standing in the shallow water it douses its head again and again, then wades out a little farther, flutters its wings and tail, comes ashore and, mounting a rock or other slight elevation, proceeds to preen and rearrange its plumage. This task is performed in a very deliberate manner, after which a meal seems to be in order. Preening and bathing do not seem to be such a conspicuous part of the birds' activities during mid-day as in the evening hours. At about seven o'clock on the evening of July 19, 1928, I counted twenty-four sandpipers—mostly spotted but some least and semipalmated sandpipers among them—bathing on a stretch of beach ten yards long at Wantry Island.

At this season Wantry and Long islands serve as roosting places for great numbers of spotted sandpipers and other shore birds. By two's and three's and in flocks of eight to ten they gather from the mainland or other places. After 7:00 P. M. new arrivals come in rapidly. At seven-thirty on the evening of July 19, 1928, I estimated that more than 200 spotted sandpipers occupied the limited expanse of Wantry Island alone.

The birds frequently rested on the bowlders near the water, with the legs folded under the body. Several dozen other shore birds, mostly least and semipalmated sandpipers, also lent their numbers to the population of the little island. At 8:00 P. M. the birds were still bathing and preening, and on the rocky point of the island, less than forty feet from my blind, more than forty birds, mostly spotted sandpipers, were performing their ablutions at the same moment. As it grew darker the birds became more quiet, but before they settled down for the night they received an addition by the arrival of a lesser yellow-legs.

The spotted sandpiper has an irritable, pugnacious disposition, not only toward other species but also toward its own kind. Fighting is one of its favorite pastimes, and although these encounters do not last long there is a great deal of action while they last. Often, without the slightest apparent provocation, there will be a sudden vicious peck—and the fight is on! With much pecking and flapping and jumping the combatants carry on for a few seconds, when one or the other is put to rout and momentary peace is restored. On one occasion I saw an adult attack a downy young of its own kind, soundly pecking it about the head and back while the youngster chirped away as though its last minute had arrived. However, none of these encounters or chastisements were followed by serious results so far as I could determine.

Even young of the year often exhibit their belligerent qualities by fighting. Many times at Verona Beach I have seen such young birds approach each other, with necks extended and wings spread, to peck each other viciously for but a moment, then lower their heads, fold their wings and go quietly on their way. I believe that this combative tendency is responsible, at least in part, for the lack of sociability of the spotted sandpiper in relation to other species of shore birds.

Preceding the nesting period, a series of courtship antics consisting of strutting, dragging the wings and posing are frequently indulged in by the males.

A great variety of nesting sites is chosen by the bird, but whatever other characteristics such places may have they are always near water. Small islands that dot the surface of the larger lakes seem to be particularly in favor here as elsewhere throughout the vast and diversified breeding range of this sandpiper.

Nesting materials also present a great deal of variation, but ordinarily dried grass makes up some part of them. In this territory the nest is commonly hidden in weeds or grass or under the edge of a grassy hummock. The few blades of grass or leaves or weed stems that form the lining are placed in a slight concavity in the ground. Four buffy eggs irregularly marked with brownish comprise the ordinary clutch. Bent (1929, p. 97) gives the following egg dates for "New England and New York; forty-one records, May 19 to July 9; twenty-one records, May 30 to June 13." The downy young are precocial and able to run about—and to "teeter"—almost immediately after their emergence from the shell. The period of incubation is said by Bent (*loc. cit.*, p. 84) to be fifteen days.

Concerning the breeding dates and habits in the Oneida Lake region, Sadler (1926, p. 7) states that "a family hatched one Decoration Day at Verona Beach. The nest was a slight depression in the sand." My own records relative to the nesting and breeding activities of the spotted sandpiper in the region I have here arranged chronologically by months.

June 19, 1929. One nest with four eggs at Wantray Island. The eggs lay in the nest with their pointed ends directed toward its center. The nest was located in a clump of canary grass about three feet from the water's edge. Aside from eight or ten such clumps of grass there was no other vegetation on the island, nor any other nests. Several spotted sandpipers were found here, but the population was frequently changing for the birds were flying to and from Long Island about a mile away. On both islands myriads of mayflies were clinging to the grass so that an abundant supply of food was available.

At Long Island the spotted sandpiper was common on this date, and I found four nests. Three of the nests contained four eggs each, and one but a single egg—egg-laying being evidently unfinished. All the nests were on slight elevations toward the central and highest part of the island. They were well hidden in and surrounded by clumps of canary grass, and composed entirely of dried grass. No doubt a thorough search of this rather long, grass-covered island would have revealed more nests of the spotted sandpiper. It was breeding here in apparent harmony with several pairs of common terns which also had eggs in the nest at this time. Two essential qualifications of a satisfactory breeding place are offered by this island, namely, food and comparative freedom from enemies.

June 26, 1928. Along Fish Creek near Fish Creek Landing the spotted sandpiper was common on this date. Saw an adult with young more than one-half grown. Other young of the year almost as large as the adults.

June 29, 1928. At Potter Bay I saw an adult accompanied by half-grown young; they were able to fly fairly well.

I was informed by Mr. Forest Walker, a farmer living near the village of Fish Creek Landing, that a pair of spotted sandpipers had a nest in his corn field in the summer of 1929. The site of this nest was some fifty yards from the farmhouse and about one-fourth mile from Fish Creek, the nearest water. Mr. Walker said that while incubation was in progress the sitting bird would not leave the nest even when, in cultivating the corn, the plow was driven in the row adjoining the one in which the bird was nesting. Four young birds hatched and left this nest successfully on July 3.

July 9, 1929. About 100 sandpipers, mostly spotted, flew up from Wantray Island when I landed there on this date. Both adults and young of the year made up the lot. The birds lit on Long Island where the grass grew tall and luxuriant, and where mayflies were so abundant that when I landed there later in the day I was forced to cover my nose in order not to inhale any of them as I made my way through the rising swarms. At Long Island I found one spotted sandpiper two or three days old, and other small young may have been hiding in the grass. However, the majority of the young of the year are able to fly well at this date.

July 24, 1928. Long Island. The spotted sandpiper is very common here and young of all ages beyond a week were seen to-day. The long grass affords shelter and excellent hiding places. Four birds, still too small to fly, were banded.

August 2, 1928. At Willard Island I found five adults, and young of the year able to fly. They left when I landed but returned as I rowed around it. I doubt if the species breeds here.

August 2, 1929. The spotted is the commonest sandpiper on Long and Wantray islands. Both adults and young of the year are there. Most of the young are able to fly, at least a short distance. I saw only one bird that was too small to fly. It is possible that there were a few others for a good many young of the year were running about among the grass and hummocks on the island. During the day the birds disperse along the lake shores and adjoining fields, returning in the evening in numbers to the islands to bathe and spend the night.

In the period from late June to late July young of all sizes and ages are much in evidence about the beaches and fields. With an incubation period of eighteen days, and young birds hatching as early as May 30 and as late as July 20 (approximately), it appears that two broods may be reared in a season.

The spotted sandpiper seeks its food on the sandy beaches and mud flats of ponds and lakes, along the borders of creeks and streams, and in the meadows and cultivated fields some distance from water. In its efforts to satisfy its cravings the bird scans not only the ground but also the vegetation it supports. Even the air is invaded in its pursuit of flying insects. While it does not feed in compact flocks like the semipalmated sandpiper, several spotted sandpipers often may be seen together on a feeding ground. In their quest the birds sometimes wade into the shallow waters along the beaches where, not infrequently, they are almost completely submerged by the incoming waves. Spotted sandpipers probe very little, their comparatively slender bill being ill fitted for that purpose.

Insects comprise a large share of the food of this sandpiper. At Long and Wantry islands where in late July and in August insects, particularly mayflies, were plentiful, I had an opportunity to watch the birds at work. Sometimes they *walked* or *ran* along picking the mayflies from the abundant growth of water-pepper (*Polygonum* sp.) which occurs there at that season. Then an individual would *reach up* as far as it could and pluck an insect from a blade of grass. Not infrequently one would *pursue* a flitting mayfly by *running*; or *spring* or *jump* into the air several inches to seize some other insect. At times, too, individuals *pitched* themselves into the air to a height of three or four feet to seize a flying insect, and dropped back to earth without having made any use of the wings. But then again, some *flew* into the air four or five feet, in pursuit of flying insects. The snap of the bill as an insect was seized was plainly audible. This seemed to be a common method of feeding and reminded one of the activities of a true flycatcher, except that the sally was made from the ground instead of from some elevated perch. The birds also would walk leisurely about through the vegetation, picking insects from it, sometimes stretching themselves to their full height or jumping a few inches off the ground in their endeavors.

Mayflies, or "eel-flies" as they are called locally, are common about Oneida Lake from June 15 on through the summer, and at times become a nuisance if not indeed a sanitary problem. For not only do these insects swarm in such myriads about the cottages and houses as to render the painting of buildings impracticable at this period, but their dead bodies washed up in windrows along the beaches create an offensive stench, in certain bays and coves interfering with bathing and other activities. Swarms rest upon the vegetation all about the lake and on the islands, where they form an abundant food supply for the spotted sandpiper and other birds.

The spotted sandpiper is not only an insectivorous bird; it feeds to some extent also upon fish. Several times at Verona Beach and at Wantry Island I observed it feeding upon small dead minnows or other fry washed up on the shore. Sometimes these small fish are swallowed entire. Evidently this little sandpiper plays at least some small part in keeping the beaches clean, while its insectivorous habits, too, are in its favor from an economic viewpoint.

Spotted sandpipers drink at frequent intervals. In this performance the body is bent forward and the neck stretched out so that the bill is held nearly parallel with the surface of the water; then at intervals the tip of the bill is immersed or dipped into the water, and raised while the act of swallowing takes place.

In the summer, the adult spotted sandpiper may be distinguished by the brownish gray upper parts which have a greenish sheen finely mottled with black, by the white line at the posterior margin of the open wing, by the comparatively short, straight bill, the greenish yellow legs and the white underparts conspicuously spotted with black. The extreme teetering habit also is characteristic. Young birds, and adults in winter, are white below with an ashy tint on the upper breast.

Eastern Solitary Sandpiper. *Tringa solitaria solitaria* Wilson.

This nearctic, appropriately named sandpiper, which breeds from southern Canada northward and winters from the Gulf Coast southward, is recorded by Eaton (1910, p. 327) as "a fairly common migrant in all parts of New York State, being more generally distributed than any other species of this order with the exception of the Spotted Sandpiper and the Woodcock."

Although the bird leaves its winter home in March it does not reach New York until early May. My earliest spring record for the Oneida Lake region is May 6, when I saw an individual among a flock of greater yellow-legs in a low meadow in the Short Point district. The species seems to reach the height of its numbers in spring about the middle of May, but in my experience here it never is a common bird. At Hitchcock Point, on the low grassy banks bordering Chittenango Creek and along the beach around the north and east sides of the point, I saw several of these birds on May 15. This district also is more or less wooded with willows, elms, maples and ashes. My latest spring record is May 18, when I saw an individual near the mouth of Chittenango Creek.

Most of the solitaires have passed northward by June 1. Returning individuals may be expected early in July, but my earliest record is August 13, when I saw one at Verona Beach. I suspect that birds returning from the north may be found in the region at least several days earlier than this record suggests. Sadler (1926, p. 7) says that it appears at Morningside Pond (Syracuse district) the first week in August.

The solitary sandpiper, solitary tattler or woodland tattler as it is variously called, is not strictly solitary in habits and may sometimes be found in small flocks along the shores of inland lakes and streams, particularly those affording bushy cover. It is a quiet bird, unsuspicious and often permits close approach before taking wing. Its flight is light and graceful, and more or less zig-zag. On alighting it elevates its wings high above its back, displaying at the same time the regularly barred pattern on the linings and axillars.

Its food is said to consist of worms, spiders, mollusks, and various kinds of aquatic and other insects together with their larvae.

Although the solitary sandpiper as a species was first described by Alexander Wilson in 1813, its peculiar nesting habits were not definitely known until June

16, 1903, when the first eggs were taken from an old robin's nest in Alberta, Canada. Since that time, eggs of this sandpiper have been found in abandoned nests of the kingbird, Canada jay, Brewer and rusty blackbirds, bronzed grackle and cedar waxwing. It seems remarkable that the actual breeding habits of so common a bird as the solitary sandpiper should have escaped observation for almost 100 years following the discovery of the species. Several accounts of its *supposed* nesting had been reported previous to 1904, the date of publication of the 1903 discovery, but now it appears these records were not authentic.

Among our shore birds, the solitary sandpiper resembles most the spotted sandpiper, not only in appearance but in choice of surroundings. The solitary may be distinguished by its somewhat larger size, longer and more slender bill, conspicuously barred outer tail feathers and lack of white bar on the wing. It has the tilting and nodding habit of the spotted sandpiper, although in lesser degree.

Greater Yellow-legs. *Totanus melanoleucus* (Gmelin).

My notes contain several records of this species in the field between May 1 and May 16. Usually the birds are found singly, but on May 6, in the Short Point district, I saw a flock of twenty-one. These were feeding and sunning themselves in a low, grassy meadow at the edge of a shallow backwater from Oneida Lake, and were accompanied by a solitary sandpiper (before mentioned). This is the largest group that I have seen in the region. The birds were wary and when I had approached to within perhaps 100 yards of them all took flight, uttering their loud "*whew-whew-whew, whew-whew.*"

During early spring and even well into May heavy rains frequently raise the lake level—inundating the grassy lowlands immediately adjoining. These flooded areas are then attractive to the greater yellow-legs as well as other related species. Only once, May 16, at Sylvan Beach, did I see this yellow-legs on a sandy beach (Fig. 187). It seems to frequent grass-bordered pools in preference to such beaches or mud flats.

The greater yellow-legs is considered a common migrant in New York State and may be expected to appear in the Oneida Lake region any time between April 15 and late May in spring, and from late July to November on its return. My records indicate that in the Oneida Lake territory it scarcely can be considered a common bird in the spring, and I have no late summer records of its occurrence. But possibly it is more common than my records indicate.

This species frequently migrates at night, in both spring and fall, when its loud notes often may be heard. On account of its wariness and its loud alarm notes it is in ill favor among gunners seeking other game birds. Because of the alarm it sounds this bird is sometimes called "tell-tale tattler" or "varied tattler." Another colloquial name it has acquired because of its late stay in the fall is "winter yellow-legs."

Only two other species are likely to be confused with the greater yellow-legs, namely, its congener, the lesser yellow-legs, and the willet. The lesser yellow-legs averages about two inches smaller and its bill an inch shorter, while the willet averages about two inches larger; in addition, the wing of the willet shows a distinct black and white pattern when in flight.

Lesser Yellow-legs. *Totanus flavipes* (Gmelin).

This smaller edition seems to be commoner in the Oneida Lake region in July than in May. Although the lesser yellow-legs may be expected from the South in late April, I have but two records of its occurrence in spring. On May 4, 1929, I saw five on a mud flat in a soggy cultivated field about three miles southwest of Lower South Bay; and on May 18, 1928, I flushed a single bird from a grassy bog near a thick growth of willows a half-mile south of the mouth of Chittenango Creek. I have not seen the bird in the region during June.

While the lesser yellow-legs commonly nests well north of New York State and returning birds put in their appearance early in July, my own first July record is on the 13th, when I came upon a much excited individual circling about over a low, flat, grassy, willow-covered marsh a half-mile southeast of Shackelton Point. The actions of the bird led me to think that it might have had young in the vicinity but I saw no signs of them.

On July 19 I saw the lesser yellow-legs on Wantry Island. My field notes contain the following item regarding its occurrence there: "At 8:10 P.M. an individual of this species joined the throng of sandpipers and appeared to be perfectly at ease in the group. After alighting it bathed and preened itself much after the manner of the spotted sandpiper. The ordinarily belligerent characteristics of the species were not manifest in this bird, at least while I watched it."

Not infrequently these birds are found some distance from water, as for example the individual seen in a hay-field three miles southwest of Bridgeport, on July 20. Butternut Creek, the nearest water of any size, was more than a half-mile distant.

Apparently the lesser yellow-legs is less common in the region in spring than in late summer and autumn. It is most likely to be found on mud flats, sand bars and grassy marshes, where it finds its food, which consists mainly of small semi-aquatic forms. Since the bird is most frequently seen in summer, one of the common names it has acquired is "summer yellow-legs." Another common name is "lesser tell-tale" or "lesser tattler." Its habits and call notes are much like those of the larger species. Its call of "*when, when-when-when-when, when-when, when,*" is subject to a good deal of variation.

In late summer, particularly, these birds are likely to be found with various related species above most of which they tower considerably on account of their longer legs. Though wary they are not especially shy. On Wantry Island one came within a few feet of my observation point, where it unconcernedly fed and performed its ablutions.

The moderate size, trim body, long slender bill, white upper tail-coverts and long yellow legs will distinguish this bird from any of our other shore birds except its larger congener, from which it is to be distinguished by size. The body averages about two and one-half inches shorter, the bill one-half inch shorter and the tarsus one-half inch shorter than in the greater yellow-legs.



Fig. 187. Greater yellow-legs at Sylvan Beach. May 16, 1928.



Fig. 188. Pectoral sandpiper at Sylvan Beach. July 12, 1928.



Fig. 189. Herring gull. Verona Beach. June 11, 1929.



Fig. 190. Ring-billed and herring gulls on stone breakwater at Sylvan Beach. August 9, 1929.

Pectoral Sandpiper. *Pisobia melanotos* (Vieillot).

The pectoral sandpiper, also known as "jack snipe," "grass bird" and "krieker," is reported by Eaton (1910, p. 310) as "a common migrant in all suitable marshes and mud flats in the State." Most of the birds evidently had gone on north by the time I arrived in the Oneida Lake region, on May 1, for during the early part of the 1928 season I saw the species only once, May 15, when in the low grassy flats near the mouth of Chittenango Creek several individuals were feeding. In the 1929 season I missed the spring movement entirely and I did not see the species until July 15.

Early spring arrivals from the winter home in the West Indies and South America are likely to appear toward the end of March. It seems likely that the northward movement continues more or less intermittently until May is well advanced, but that the bulk of the spring migration, at least so far as the Oneida Lake region is concerned, is ended by May 1. However, from my observations I believe that the pectoral sandpiper is commoner here in late summer and early fall than in spring.

Although the species "breeds mainly on the Arctic coasts of Alaska and Mackenzie" (Bent, 1927, p. 178), some individuals apparently do not remain long on the breeding grounds. My earliest date of fall arrival is July 12, 1928, when I found a few adults and several young feeding on the sandy beach at the east end of Oneida Lake (Fig. 188). The birds were unsuspicious and permitted me to approach within a few feet. The young were a little smaller and had shorter tails than the adults; also, faintly streaked below. While the pectoral occurred here along with the more common spotted sandpiper, it seemed to be rather quarrelsome toward it. Much of the time of the pectorals was spent in running along the beach, stopping at frequent intervals to probe into the finely ground greenish plant refuse lying in windrows here. Examining this material I found it harboring several kinds of aquatic and semi-aquatic insects and their larvae. In the following season I first saw the bird at Verona Beach on July 15.

While the numbers of the pectoral sandpiper in the Oneida Lake region seem to be augmented somewhat by new arrivals from mid-July on, the species had not become common up to August 15, in either of my seasons of observation. However, I suspect that about the last week of August or the first of September the southward movement has begun, the species reaching the peak of its numbers here in the latter month; and by mid-October the bulk of the movement has passed. Bent (*loc. cit.*, p. 180) gives the earliest date of fall arrivals in New York as follows: "Syracuse, July 2, Orient, July 4, Rochester, July 10, and East Hampton, July 11." My supplementary records of July 12 and July 15 fit in well with this series.

I found this sandpiper not only on the beaches at the east end of Oneida Lake in the late summer and early in the fall, but also on the sandy and pebbly shores of Wantry and Long islands. Here, throughout the latter half of July and the first half of August, I found both adults and young of the year regularly present, though never in any large numbers. On the whole it was the least numerous of the sandpipers found there. I have no doubt that also the other sandy islets and knolls in the lake are visited frequently by the species. Although

somewhat belligerent it associates more or less freely with the least, semipalmated, spotted and other sandpipers so common on these beaches at that season.

On September 9, 1927, at Sylvan Beach, Dr. C. E. Johnson saw a single bird feeding with six semipalmated sandpipers. Other available records and those of my own indicate that in the Oneida Lake region the pectoral sandpiper is a fairly common transient visitant, commoner in late summer and autumn than in spring.

While in late summer at least, the pectoral sandpiper visits the sandy beaches freely, in spring, and in fall also, it is likely to occur in scattered flocks in grassy fields. When flushed it arises with a flutter of wings and for a short distance the flight is hurried and erratic, but if continued it soon becomes swift and direct. Sometimes flocks of birds are encountered but ordinarily the species occurs singly. It does not mingle much with its fellows or with other shore birds except on beaches where I have most commonly seen it in this territory.

That this bird takes advantage of the similarity of its coloration to that of the grassy situations which it frequently chooses, is shown by the habit it has when alarmed, of remaining motionless with upstretched neck. When in this position its brownish streaked plumage blends in so well with the lights and shadows of the grass surrounding it that detection is difficult. If pressed too closely it rises quickly with a hoarse cry, "*kriek-kriek*," somewhat like that of Wilson's snipe.

The diet of the pectoral sandpiper is largely insectivorous, the bulk consisting of grasshoppers, beetles, cutworms and two-winged flies. Snails, crustaceans and the like, together with some vegetable materials, make up most of the remainder. In addition to its value as a destroyer of insects the species is of considerable importance as a game bird, but it is now wholly protected by law. Perhaps at some future time, when and if the bird ever again becomes as plentiful as it was in the day of Audubon, the gunner may again have the pleasure of seeking out the "*krieker*" in its favorite haunts.

The stocky, short-legged, plump-bodied appearance of the pectoral sandpiper is characteristic. The snipe-like colors of the upper parts, the heavily streaked dark breast sharply set off from the white of the lower breast, together with the yellowish or greenish legs and the pale gray tail with its nearly black central feathers and rump are all helpful field characters.

Least Sandpiper. *Pisobia minutilla* (Vieillot).

This smallest of our sandpipers is one of the commoner shore birds in the Oneida Lake region, ranking next to the spotted and the semi-palmated sandpipers in abundance.

I have no spring records for the least sandpiper, for it had evidently moved on to the northern breeding grounds before May 1. Dr. C. E. Johnson recorded two birds at Sylvan Beach on April 17, 1928. My earliest return record is July 9, 1929, when the species was noted on Wantry Island, along with a great group of spotted and semipalmated sandpipers—more than 100 in all—which arose from the island when I came ashore. In the 1928 season my first autumnal record was July 19.

While evidently a few early stragglers may put in their appearance here before July 15, the bulk of the arrivals from the breeding grounds, which extend from the Gulf of the St. Lawrence on northward, reaches this territory after that date. As shown by my records, the species becomes increasingly common up to about mid-August, when its numbers seemed to fall off somewhat. But even at this date I suspect that some of them had already moved on south although the main body probably departs in September, a few perhaps remaining into October.

In the East, the winter range of the least sandpiper extends from the coast of South Carolina southward as far as Brazil.

Like the pectoral sandpiper, the present species frequents sandy shores, mud flats and grassy meadows. In this territory I have observed it most frequently on the beach at the east end of Oneida Lake and on Long and Wantray islands. The low-lying mud flats about the entrance to the Barge Canal at the village of Sylvan Beach, and at Constantia and Bernhard Bay, as well as the limited expanses of sandy beaches in the Delmarter Bay, and other districts immediately adjoining Oneida Lake, offer good feeding grounds.

The two following extracts from my field notes refer to the least sandpiper on Wantray Island.

"July 19, 1928. About half a dozen individuals were seen on the island along with larger numbers of the spotted and semipalmated sandpipers. They were running about on the beach, feeding and preening and bathing in the shallow water. They did not bathe as often as the spotted sandpipers. After a bath they frequently preened their feathers for a time or stood motionless, with head resting upon the back, until the urge to feed again prompted them. Small aquatic and land forms seem to furnish the bulk of their food. These birds appeared not to be molested much by the larger and pugnacious spotted sandpipers.

"July 24, 1928. Common on Wantray Island; the numbers increasing as night comes on. Evidently this is a favorite night retreat and roosting place. Little groups keep coming in continually, either from Long Island or surrounding territory, and their rapid "*peep, peep, peep*" is now a characteristic sound on the island. Some of them feed by probing very rapidly in the green beach wash. They like to bathe, too, standing in water up to the body and teetering to and fro. By this method particularly the feathers about the vent are cleansed. These ablutions are energetic and sometimes last several minutes, when the birds come ashore to preen and dry their feathers. Bathing seems to be most popular after 6:00 P. M."

These birds showed no tendency to fight among themselves, and their relations with other species were friendly.

So unsuspecting are these little "peeps" or "oxeyes" and so assiduously do they devote themselves to searching for food that one usually may approach them closely. They are both gregarious and sociable, and associate freely also with other sandpipers and beach birds. When alarmed or approached too closely a group will take wing in a body, flying low and wheeling and circling with military precision, and perhaps returning after a short flight to the spot

from which they took wing. At Verona and Sylvan beaches these mixed flocks composed of semipalmated, spotted, pectoral and least sandpipers and killdeer and semipalmated plovers, are much in evidence during late July and early August. The least and semipalmated sandpipers seem to mingle in more intimate fashion than do any of the others.

Ordinarily a combination of field characters must be relied upon to distinguish even the adults of this species with certainty. Its small size sets it out at once from all other close relatives except the semipalmated sandpiper. Indeed, the least sandpiper looks very much like a small edition of the pectoral sandpiper. From the semipalmated sandpiper the least may be distinguished by its usually smaller, more tapering and slightly decurved bill, and the color of the tarsi which "are distinctly yellow with a faint greenish cast." (Bent, 1927, p. 207.) In the breeding plumage there is a little more rufous in the upper parts of the least than of the semipalmated.

Semipalmated Sandpiper. *Ereunetes pusillus* (Linnaeus).

In late summer at least this sandpiper in the Oneida Lake region is nearly as common but probably not so generally distributed as the spotted sandpiper. In company with the least and spotted sandpipers, the semipalmated plover and other shore birds that may be present, this little sandpiper or "sand peep" frequents the beaches and islands of Oneida Lake in numbers from July 10 on to near the close of the summer.

The spring movement of the species is likely to begin late in April and continues into June; but at this season it does not seem to be well represented in the Oneida Lake region, for I have seen only a single example. On May 29, 1928, this individual was noted on the pebbly beach at Shaw Point. I approached within a few yards of the bird which seemed much less wary than the spotted sandpiper that was with it.

The species breeds from northern Quebec and Newfoundland and north and northwestward. In the East it winters from South Carolina to the West Indies and northern South America.

My earliest record for returning birds is July 9, 1929, when I saw a single example on Wantry Island. But within a few days after this date the beaches at the east end of the lake and on Long and Wantry islands were well populated with this species. In the preceding season my earliest record was July 19, when considerable numbers of both adults and juveniles were present.

As is the case with most of the other shore birds in the region, the centers of concentration appear to be the sandy beach expanses at the east end of Oneida Lake and the low, flat, pebbly Long and Wantry islands.

The following are quotations from my field notes:

"July 9, 1929. Wantry Island. Identified one semipalmated sandpiper with certainty; probably there were others in the great flock of spotted and least sandpipers that flew to Long Island and the near-by grassy islets upon my arrival at Wantry.

"July 15, 1929. This sandpiper is the commonest one on Verona Beach now, but judging from last season's observations its numbers will be consider-

ably augmented by new arrivals within the next few days. The birds are probing in the sand and soft débris near the water's edge. They are the least shy of any of the sandpipers.

"July 17, 1929. At Verona Beach its numbers have already been considerably strengthened by new arrivals since my visit of two days ago.

"July 24, 1928. Wantry Island. Until about 7:00 P.M. this was the most abundant species of sandpiper on the island. With the arrival of several dozen spotted sandpipers the semipalmated was reduced to second place in point of numbers. The bird was also fairly common at Long Island.

"The semipalmated, too, likes to bathe at frequent intervals. Watched one bird in this act. After bathing it pulled the feathers of the breast and belly rapidly between the mandibles, thereby squeezing out the water and readjusting any hooklets that might have become disengaged. This procedure was followed by oiling the feathers. After a few minutes the bird was ready to feed again.

"July 28, 1928. On the mud flats along the south side of the Barge Canal at Verona Beach I saw several groups of three or four semipalmated sandpipers, and one flock of more than twenty individuals accompanied by a few least sandpipers. When alarmed they left the feeding place in a body and after characteristic evolutions returned to another spot near by. These short sorties are often accompanied by a hurried '*ki-i-ip, ki-i-ip.*' The flock is more wary than the individual. It was the commonest sandpiper on the beach here today.

"August 1, 1928, Verona Beach. The semipalmated is very common on the beach proper and about the numerous beach pools that support a sparse growth of vegetation. It occurs singly as well as in flocks of twenty to thirty birds. A good many intermediate plumages are exhibited among these individuals. There are almost typical breeding as well as near-winter plumages. Various stages of plumage development in the young also are noted.

"August 2, 1929. A few of these birds on Long Island; more on Wantry Island. I believe that this and other species of sandpipers are scattered about the lake shores and beaches, where they feed during the day, but that they congregate on these more or less isolated islands to pass the night. On my evening visits to these islands I have always found them to be more heavily populated with sandpipers than on morning or mid-day visits.

"One thing I have noticed as characterizing the bird here is that it seldom or never runs through the tall grass about the islands, but keeps well to the exposed beach where it feeds by quick shallow probings. In this respect it differs from the spotted but resembles the least sandpiper. At times a bird wades out into the shallow water to pick a bit of food from the surface, when an incoming wave forces it to return quickly to shore, or to leap into the air and flutter for a moment until the waters again recede. The same happens to little troupes or flocks.

"August 6, 1929. Semipalmated by far the most plentiful sandpiper at Verona Beach this morning, occurring in small flocks in company with a few least and spotted sandpipers and semipalmated plovers. It is continually feeding by probing in the moist sand and in the débris.

"August 13, 1928. Verona Beach. The semipalmated sandpipers in small flocks along with the least and spotted, but more plentiful than either. All sorts of intergradations between winter and summer plumages apparent. They probe rapidly in the water of shallow beach pools and in beach drift, sometimes immersing the entire head in this process. They often feed upon dead minnows and other small fish in the beach drift as noted both here and at Wantry Island.

"August 13, 1929. Wantry and Long islands. Common in both places; perhaps slightly surpassed in numbers by the spotted."

From the foregoing observations it will be seen that the semipalmated sandpiper is a very common fall migrant in the Oneida Lake region. Its presence in numbers at this time adds life and a note of cheer to scenes that are becoming dull and drab.

This species, once threatened with extinction because of the excessive slaughter has now been removed from the game bird list and is apparently responding readily to this protection.

The semipalmated sandpiper is similar to but slightly larger than the least sandpiper with which it is so frequently associated; in addition, its plumage is more grayish, the bill straight and stout, and the tarsi and feet black. The half-webbed condition of the feet will at once suffice to distinguish the species in the hand, but of course this character can be seen only under exceptional conditions in the field.

Sanderling. *Crocethia alba* (Pallas).

The sanderling, surf bird or beach bird, is most commonly seen in New York State from the latter part of July to November 1, although it frequently occurs in early July and late November. Spring birds are most likely to be seen in eastern New York. I have no spring records of the sanderling in the Oneida Lake region. My earliest summer record is July 24, 1928, when I saw a single individual in immature plumage on the sandy shores of Wantry Island, where it associated freely with pectoral, least, semipalmated and spotted sandpipers. The three latter species were particularly abundant here, and opportunity was had to compare and contrast the activities of the birds.

Again on August 8 I found a single bird at Wantry Island, when I arrived at 4:45 A.M. The individual observed at this time seemed unafraid and permitted close approach. It often ran along the beach from one end of the island to the other, stopping at short intervals to feed, or to preen its plumage. Then it would rest awhile, standing on a water-lapped stone with its bill tucked in the plumage of its back. Whereupon it resumed feeding or bathing or chasing a least or semipalmated sandpiper that might have approached too near. The sanderling had a rather domineering disposition, especially toward the smaller sandpipers, for it frequently ran after them and attacked them vigorously though without apparent injury.

At Verona Beach, on August 13, I saw two sanderlings—one with the upper throat and breast heavily washed with pale rufous—feeding on dead minnows and other small fry and probing in the soft beach drift. Numbers of other shore birds of several species were also present. The sanderlings were rather

more wary than the others. No doubt a little later in the season more of this species are found here as other south-bound individuals stop to rest and feed. Dr. C. E. Johnson records a single individual feeding with two black-bellied plovers, at Sylvan Beach, on September 9, 1927.

Ordinarily the sanderling is gregarious. It is almost exclusively a beach bird, so the sandy islands in Oneida Lake and the expansive beach at its east end are probably the only places in the region where it is likely to be seen. The voice of the bird has been described as a shrill "*wick*." I have heard also a low peeping note. The bird nests in the arctic regions, so performs an extended migratory journey each year between its winter home and its breeding range.

This is the whitest of our sandpipers and the summer birds that I have seen here have a plump and well-fed appearance. It is our only snipe or sandpiper that has but three toes.

GULLS AND TERNS: FAMILY LARIDAE.

Herring Gull. *Larus argentatus smithsonianus* Coues.

This large gull is said to be "the commonest and most generally distributed gull in the state" (Eaton, 1910, p. 128), but during both my seasons of work in the Oneida Lake region it was clearly exceeded in numbers by the ring-billed gull.

Here as in many other places in the State the herring gull may remain in small numbers about open water, throughout the winter. In the spring, when the ice has melted, its ranks are augmented by arrivals from farther south, but most of them have moved on north by May 1. During May, 1928, I saw but two live birds in this territory, one on May 18 near the mouth of Chittenango Creek, and another flying along the lake shore at Lower South Bay, on May 19. A few days earlier I found the decaying body of a herring gull on the beach at Hitchcock Point, probably killed by some gunner. In May, 1929, I did not see the bird at all. Only one, and that a cripple, came to my attention during June of either season, while my earliest mid-summer record is July 15, 1929, when both adults and young were observed at Sylvan Beach near the entrance to the Barge Canal. From this time on to the close of my observations the species became more common as its numbers were increased by additions from farther north. The broad sandy beach at the east end of Oneida Lake, together with Wantry and Long islands then constitute its favorite gathering places where, with the ring-billed gull, it congregates in numbers to feed and bathe and preen.

The injured bird above mentioned was seen on June 11, 1929, at Verona Beach. The upper mandible as far as the forehead had been entirely lost—shot away by some gunner—but the lower mandible was intact and plainly showed the reddish subapical mark. The bird stood at the water's edge, sunning itself, but looked rather dejected. It could swim and walk, as I discovered when I approached it, but apparently preferred not to exert itself. As it swam it pecked at some object floating in the water, as though attempting



Fig. 191. Ring-billed and herring gulls in flight about breakwater at entrance to Barge Canal. Sylvan Beach. August 9, 1929.



Fig. 192. Nest and eggs of common tern on Long Island. August 2, 1929.

to feed. But with its bill in this condition I do not see how it possibly could take food. (Fig. 189.)

Although Eaton (*loc. cit.*, sec. 1, pt. 10) records the herring gull as a summer resident in Oneida County no breeding date is given, and I suspect that its status there now, as in most other interior sections of the State, is that of a transient visitant. My own records all point to that conclusion. The breeding range of this bird in this part of the country, Bent (1921, p. 119) says, is "In North America east to the Atlantic coast, south to central Maine (Penobscot Bay), central New York (Lake Champlain, Hamilton, Herkimer, and Oneida Counties), southern Ontario (Great Lakes)." Possibly the bird still breeds in the Adirondack region. While Silloway (1923, p. 476) mentions it as occurring at Cranberry Lake in mid-summer of 1916, he does not state specifically that it breeds there. It is not unlikely that here as in many other places where it formerly bred it has been molested or persecuted sufficiently to cause it to seek nesting places elsewhere.

In the season of 1928 I did not see the herring gull at Oneida Lake between May 19 and July 24. On the latter date about 7:30 P.M., while on a visit to Long Island a large flock of common terns was making life miserable for a herring gull swimming in the water just off shore. The terns darted down and pecked the gull on its head and neck, chattering loudly the while, and finally drove it far out into the lake. On a subsequent early morning visit to Wantray Island I noted an immature bird swimming just off the north side. It remained there for about two hours and finally came ashore to sun itself and preen its feathers. I could approach the bird no closer than about twenty yards, but it made no effort to escape by flying. When pressed too closely it merely slid into the water and swam away. On August 10, a flock of fifteen adult and immature birds, mostly the latter, was seen off Wantray Island. The largest flock of herring gulls that I saw during this season contained between twenty-five and thirty birds.

In the 1929 season, the first mid-summer herring gull was noted nine days earlier than in 1928. In 1929, also, the bird was more common than in 1928. After July 15, adults and young were always to be seen in numbers about Sylvan and Verona beaches. As the summer waned the birds became more plentiful.

Early in August adult and immature herring and ring-billed gulls congregate about the stone breakwater near the entrance to the Barge Canal, at the east end of Oneida Lake (Figs. 190 and 191). On August 6, 1929, I counted 150 individuals of both species here, but the ring-billed was the more numerous of the two. No doubt the heavy northwest wind of the preceding three days was responsible for this sudden influx. The two species seemed to mingle freely and without more than the usual amount of commotion noted in flocks made up entirely of birds of either species. They fed, bathed and preened and chased one another about over the rocks and beaches, or indulged in noisy but otherwise harmless combats. The harsh "*waw-waw-wak! wak-wak! wak-wak!*" is a frequent accompaniment of these struggles.

A number of pilings have been driven into the mud at the entrance to the Barge Canal and on sunny days the top of every timber is occupied by one, sometimes two, of these gulls. A continuous struggle goes on among them for the possession of these points of vantage. Occasionally little groups of the birds gather along the beaches to sun themselves, after which they fly out over the lake in a body and come to rest in a compact flock on its surface, a half-mile or so from the beach.

On August 9, 1929, I counted ninety-six herring and ring-billed gulls on the sand-bar at the entrance to the Barge Canal. Again the ring-bills were in the majority, the proportion being about three to one. Adults and juveniles were represented, individuals intermittently chattering and fighting. Twenty others of both species occupied the tops of the pilings a short distance away.

While the flight of the herring gull varies with the conditions, it is an expert performer. "It can fly forward or backward, veer gracefully in any direction, soar with stiffened pinions or shoot downward like an arrow, sail on steady wing against the wind and perform numberless evolutions with grace and ease. In calm weather it flaps along much like a heron, and ordinarily when traveling this is its mode of progression; but when the wind blows, it sails, wheels, rises and falls with great speed and power. Large flocks sometimes swing in wide circles and rise to immense heights." (Forbush, 1925, p. 77.)

This gull is also an excellent swimmer. Its body rides high in the water. On occasion, as for example when pursuing a school of fish, it can dive with alacrity. It has a considerable range of vocal ability, from a high-pitched squeal or whistle to a hoarse resonant quack. Its habit of associating with other gulls is well illustrated in the above discussion.

Herring gulls are social birds and breed in large or small colonies near water. Coastal islands and islands in inland lakes are frequently chosen. The nest, which is composed of grasses, weeds, sticks and the like, is usually placed upon the ground, but nests in trees are not unusual. Three eggs constitute the usual set, and the incubation period is said to average twenty-six days. The eggs vary in color from bluish to light brown and are irregularly marked usually with some shade of brown. The young are precocial but require the attention of the parent for some time after hatching. Eaton (*loc. cit.*, p. 130) says that "In the Adirondacks the eggs are laid from the first to the thirtieth of May."

While the natural food of the herring gull consists of fish, mollusks, insects and various other kinds of aquatic and semi-aquatic forms which it catches alive, dead and decaying fish or other carrion or offal of the beaches forms an important part of its diet. The bird renders a service of no little importance in keeping the shores and beaches clean. It is largely about the harbors that its scavenger habits are most valuable. While occasional complaints have been lodged against the herring gull for stealing fish from fields whereon they have been placed for fertilizer, and while it does at times destroy the eggs of other birds, nevertheless, usefulness of the bird as a scavenger more than compensates for any damage done. From an esthetic viewpoint, also, this is a desirable species.

Adults in the breeding plumage have the mantle mostly pearl gray, while the head, neck, tail and under parts are pure white.

The large size of this species will distinguish it readily from any of our commoner gulls. In summer the adult has a yellowish bill with a red spot above the angle of the lower mandible; the legs and feet are pale flesh color. The prevailing color of young in first winter plumage is dark grayish brown.

Ring-billed Gull. *Larus delawarensis* Ord.

During the breeding season the ring-billed gull occurs mainly in the interior of British America. In the Oneida Lake region the species seems to be a fairly common transient visitant. While I have seen it here in May, June, July and August, I doubt if it breeds in this territory. It is commonest in August when numbers of adult and immature birds, together with herring gulls, congregate on the eastern sand beaches and the larger islands of Oneida Lake.

Normally, the winter home of this gull in the East extends perhaps from southeastern New York along the Atlantic coast to Florida and Cuba and along the Gulf coast to Mexico. By May the northward movement is probably well over so far as the Oneida Lake region is concerned, the peak of the spring abundance being reached probably in mid-April. From that time on its numbers gradually diminish and few remain by May 1. On May 2, 1928, I saw a single individual flying near the lake at Lower South Bay. I did not again see the species in this territory until August 8, when two birds were seen flying over the lake near Wantry Island.

In May, 1929, I saw the ring-billed gull on two occasions, once at Maple Bay where a single bird in immature plumage was seen (May 8), and once (May 13) at Sylvan Beach when seven adults were noted.

While it seems likely that most of the ring-bills have passed on north by May 10, those that I have seen here in June can scarcely have returned from the northerly nesting grounds so early and I am inclined to believe that a few remain here throughout the summer, possibly to breed. On June 11, 1929, I saw four birds in immature plumage feeding in the shallow water off Verona Beach. From time to time the birds dropped into the shallow water from the wing, apparently to seize fish or other food. While on the water they remain close together.

Late in the afternoon of June 19, 1929, I saw a single bird in adult plumage flying across the lake near Wantry Island.

The next calendar date on which I saw the ring-billed gull was July 15, 1929, when, in company with the several herring gulls, a number of adults and juveniles were noted about the pilings at Sylvan Beach, near the entrance to the Barge Canal. This appears to be an early date, for young birds to have returned from their northern breeding grounds, and suggests the possibility of a few nesting locally.

Egg data are given by Bent (1921, p. 140) as follows: "North Dakota: Forty-eight records, May 9 to June 22; twenty-four records, May 31 to June 15. Saskatchewan and Manitoba: Seventeen records, June 4 to 23. Quebec Labrador: Ten records, June 20 to 30." If the immature birds seen here

on June 11 were reared in central Canada they must have been hatched from eggs that were laid well toward the beginning of the breeding season, and must have left that region almost as soon as they were able to fly.

After mid-July the number of ring-bills increases slowly as adults and immature birds gather about Sylvan and Verona beaches, where they feed and bask in the sun and preen themselves in company with the herring gulls (Figs. 190 and 191). The stone breakwater at the entrance to the Barge Canal is a favorite resting place, in addition to the tall pilings near by. There is much fighting and harsh scolding as the two species vie with each other for positions of vantage here. By August 1, both species have become common, adult and immature birds represented, the latter leading in point of numbers. The ring-bill is the more plentiful of the two species.

On August 6, 1929, I made the following field note regarding the ring-billed gull near the breakwater at Sylvan Beach. "Adults and immature along with the herring gulls flew off in a great flock as a fisherman walked onto the breakwater. They lit in the water near by. This flock contained more gulls—150 individuals of both species—than I have ever seen here before at one time. I think that the ring-bills were the more numerous, and the young of the year outnumbered the adults. Perhaps the high winds of the past three days are partly accountable for this concentration of the birds."

Another note under date of August 9, 1929, states that at the "sand bar on the south side of the entrance to the Barge Canal at Sylvan Beach I counted ninety-six ring-billed and herring gulls. The birds were intermittently calling, fighting, feeding, preening themselves, and resting contentedly in the sunshine. There seemed to be three or four ring-bills for every herring gull. At 5:00 P.M. a combination count and estimate indicated between 125 and 150 birds of both species in the immediate vicinity, of which about two-thirds were ring-billed gulls."

That the ring-bill frequently visits the larger islands of Oneida Lake, in late summer at least, is shown by my several records of both adults and young about Wantry and Long islands. Although Sylvan Beach is its favorite point of concentration in the territory, the bowldery shores of both these islands also attract this gull. In mid-August I have seen as many as twenty-five or thirty birds, mostly immature, feeding and bathing in the shallow water about the islands, which were visited more by the ring-billed than by the herring gulls.

It seems that the ring-billed gull is even more sensitive to persecution by eggers, hunters and predators in general than is the herring gull, and so has retired, for the most part, into the more remote and inaccessible districts farther north. During its migratory movements or when away from its breeding grounds it is sociable and gregarious, not only associating with its own kind but also with other gulls, as with the herring gull at Oneida Lake. Its sociable and gregarious tendencies are exhibited also on its breeding grounds where it nests in colonies on islands. Its manner of flight and behavior in general are much like those of the other larger gulls. It swims gracefully and buoyantly. When undisturbed the ring-bill sometimes utters a low "*kawek*," but when alarmed gives vent to a shrill "*kree-kreec*."

In common with most other gulls, this species is omnivorous, feeding upon living aquatic forms, and acting as a scavenger about harbors, beaches and lake shores where it feasts upon floating refuse, the carcasses of dead fish and other waste that is in the water or on the beach. Dump heaps are a favorite feeding place of these birds. In the western agricultural sections it is said to feed upon various kinds of insects, and on its breeding grounds it sometimes feeds upon the eggs of other birds. (Bent, *loc. cit.*, p. 138.) The service of the ring-billed gull as a scavenger, its pleasing appearance, both at rest and in flight, and its gentle and confiding manner justify the legal protection that has been accorded it.

Adults in summer with pearl gray mantle; under parts white. Bill greenish yellow with a black ring or partial cross-bar. Tarsi and feet greenish yellow. The black of the primaries has distinct terminal white patches. Immature with upper parts grayish brown, more or less mottled, spotted and streaked; under parts white, more or less mottled with fuscous. Bill yellowish at base, the tip black.

Bonaparte's Gull. *Larus philadelphia* (Ord).

Although Bonaparte's gull is said by Eaton (1910, p. 135) to be one of the most generally distributed gulls in the State, and "occurs as a transient visitant in considerable numbers on our inland lakes, as well as on the sea-coast," I have seen it less than a half-dozen times in my two summers of field work in the Oneida Lake region. Possibly this was because most of the individuals had gone north before my arrival, May 1. However, if the bird were at all common here I should have seen it more frequently even after that date, for northerly breeding birds are likely to be found in the interior as late as June. Returning birds are likely to appear in late September and early October; they depart for the South a month later. I suspect that this gull is less common in the interior of the State than it was twenty years ago.

In the 1928 season I saw Bonaparte's gull once. At 5:20 A.M. on August 8, a single adult alighted at the north end of Wantry Island. It was in summer plumage. It came in company with a group of common terns, and my attention was first drawn to it by its lower and less raucous call. Although the bird was not particularly shy—I approached it close enough to make out the black bill with the unaided eye—it left after a few minutes.

During the 1929 season I twice saw Bonaparte's gull. On May 13 at Verona Beach I saw two individuals, one in adult plumage and another in immature or winter plumage. On July 30, a single adult flew over this beach just south of the Barge Canal. In addition to these records, Sadler remarks, (1926, p. 3) for the Oneida Lake region, "July 27, 1923, saw six at Verona Beach, Oneida Lake. May 16, 1924, saw ten at Brewerton." The east and west ends of the lake together with Long and Wantry islands are the most likely localities for this gull, which seems to fluctuate considerably in numbers from season to season.

"This little gull is more often found in flocks than our other species and is frequently seen flying over swamps and plowed fields, searching for worms

and insects; but it is usually met with on the lakes and rivers hunting its food like the herring gull." (Eaton, *loc. cit.*, p. 135.) Early spring arrivals from the winter range, which on the Atlantic coast extends from South Carolina on southward (Bent, 1921, p. 179), may be expected in the Oneida Lake region early in April. As above indicated, most of the individuals have gone north by May 1, although a few stragglers may remain somewhat later; and possibly some non-breeding birds may be found here during the summer.

Bonaparte's is the smallest of the gulls likely to be found in the Oneida Lake region. Its size and, in addition, the dark slate-colored head (summer plumage), the white primaries with the outer webs of the first and second margined with black, the black bill and the orange-red feet are helpful field characters.

Common Tern. *Sterna hirundo hirundo* Linnaeus.

The common tern, sometimes called "sea swallow," formerly bred in numbers in various parts of New York State, particularly in the southwestern section, but it is now rated principally as a transient. Concerning its status as Eaton knew it he says (1910, p. 145): "In the interior of this State this bird is a fairly common transient visitant, especially on the Great Lakes, but it is not known to breed within our limits except on the sea coast, where it was an abundant summer resident in Giraud's day. It is a bird of holarctic range, in America breeding from the Gulf coast to Greenland."

While this tern undoubtedly occurs for the most part as a transient in the Oneida Lake region, where it arrives late in April—Sadler (1926, p. 3) gives April 21, 1917, as the earliest date seen—our observations show that a few at least remain to breed on Long Island in Oneida Lake, about one and one-half miles south of Constantia. Evidence on this point was obtained during both seasons (1928 and 1929), the details of which are set forth in the following paragraphs. In the former season I did not see the bird until July 19, when I visited Wantry Island, while in the 1929 season it was observed on June 19 on my first visit of the season to Wantry and Long islands. By May 1, therefore, the birds had already taken up quarters on the islands, and evidently remained in the near vicinity or I should have seen them elsewhere on my daily journeys about the lake and adjoining territory. Their southward movement to the winter quarters, which are principally in South America, takes place late in September and the first half of October.

Since the occurrence of the common tern here in summer and its nesting upon Long Island are of more than local interest I will refer in some detail to the situation as I found it.

Had I visited Wantry Island earlier in the season of 1928, I would undoubtedly have found the bird in that vicinity. However, it was not until late afternoon of July 19 that I set foot on this long, low gravelly elevation. At that time four adults were flying over and about the island, uttering their characteristic, shrill "tee-ar-r-r-r-r." At times the birds flew high and again quite low, their slow and deliberate wing beats lifting the body with each stroke. I

did not visit Long Island on this trip; but at no time during my stay did the terns alight on Wantry. I saw only four individuals.

On July 24, 1928, not having seen the common tern anywhere about the lake since July 19, I again visited Wantry Island. As I arrived ten birds were resting there, but left immediately, only to return at intervals to scold from the air. One of the birds that flew over was carrying a small fish. About 7:30 P.M. I rowed to the low, grassy Long Island, a half mile to the southeast, and there counted 21 common terns. They were pursuing a herring gull that had invaded their precincts, swooping down at intervals to peck it on the head or back as it swam along. The gull made no attempt to take wing, as if realizing that its more active tormenters would have a better opportunity to attack it in the air than on the water. Meanwhile the terns kept up an incessant chatter at the gull as well as at the human trespasser on their domain.

On August 2, 1928, I saw four common terns flying over Willard Island, and on the following day one flying over the lake in the Constantia district.

My next visit to these islands was in the early morning of August 8, 1928. Again the birds flew about Wantry, expressing their disapproval of my presence by their harsh cries; but they made no sudden, disconcerting aerial dashes at my head such as is the habit of the black tern when its breeding haunts are invaded. Every few minutes two or three of the birds flew around the island as if inspecting it, sometimes stopping to rest on the rocks projecting from the water. Frequently a bird could be seen carrying a fish, which led me to suspect that they might be feeding young. Long Island seemed to be the stronghold of the birds for I counted twenty-five of them in the air above it at one time. Upon my approach to this island their shrill cries burst forth as they dived and circled and wheeled in mid-air. All the birds observed were adults in breeding plumage; but I found no nests or young birds although I searched through the tall grass for them.

Two days later, in company with Dr. J. F. Mueller of the Department of Forest Zoology, I again visited the islands. As we approached, the birds could be seen diving into the lake for fish, or swimming placidly about. Some came to circle and hover about our heads, uttering their harsh cries continuously. Occasionally one would pursue a great blue heron flapping its way laboriously across the lake.

My suspicion that the common tern had been nesting on Long Island was confirmed when we found three downy young, about three weeks old, accompanied by an adult and swimming about one-fourth mile off the island. After a chase in the boat we captured the young and, amid the discordant and angry cries of some twenty adults, banded them. This was my last visit to these islands in the 1928 season but I feel confident that had thorough examination of this island been made in June or July, nests and eggs would have been found.

The following season my first visit to Long and Wantry islands was made on June 19, when some twenty-five or thirty common terns were flying about or resting on the rocks, as on the occasion of my former visits. A thorough search for nests and eggs was made on Wantry without results, but on Long Island I found four nests, two of which contained two eggs each, and the other

two, three eggs each. The remains of a fifth nest were found, and possibly others were overlooked.

The nests placed on the highest part of the island, at varying distances from the water's edge, were composed of a small amount of dry canary grass fitted into a slight concavity in the moist pebbly soil. They were in more exposed situations than those of the spotted sandpiper and not so closely surrounded by grass. This sandpiper, as previously noted, nests here in numbers and is, I believe, the only other species nesting on the island.

The ground color of the eggs of the tern varied from olive-gray or pale green to ashy olive brownish; on this were heavy markings of chocolate-brown. The markings and the ground color on all the eggs of a given set were the same.

My next trip to these islands was on July 9, when I found three additional nests on Long Island. One of them evidently had just been completed, for some fragments of the scanty grass and fern lining material were still green and fresh. The green lining was supported by a few stalks of dried grass, and all three nests were placed on slightly elevated rocky sites a few feet from the water, closely surrounded by tall canary grass. Ferns do not grow upon this island; the nearest point at which they occur is on the north shore of the lake near Constantia. So the birds must have brought this material from some locality on the mainland. Two of the nests contained two eggs, and the third, three. I opened one of the eggs and found the embryo about two-thirds developed.

In addition to these nests I discovered several young birds, two of which I banded. Possibly still other nests or young were hidden in the grass. One of the young that I banded was about a week old, the other apparently about two weeks. The young in the characteristic buffy plumage spotted with darker, made no attempt to run; but one of them squatted motionless in the nest, the other among the pebbles. So thoroughly did this coloration blend with the dried grass and the background of gravel and pebbles that from a little distance the young terns were difficult to see, even when one knew just where to look for them.

On another visit to Long Island on August 2, about fifty adult terns were present; some of them were carrying food. I saw no small young but found one half-grown dead bird. In addition, I found three more nests, which contained respectively one, two (Fig. 192) and three eggs. Examination of one of the eggs showed that incubation was perhaps two-thirds completed. The "nest" containing the three eggs scarcely deserved the name, for it was simply a concavity in the loose gravel with a very few straws for a lining (Fig. 193). All the nests thus far discovered have been well concentrated toward the west side of the island where it is flatter and more gravelly, and the grass sparse.

Judging by the number of terns present here on this date, it seems likely that the local ranks of the species had been augmented by arrivals from farther north.

My last visit to Long and Wantriy islands was on August 13, 1929. At this time more than fifty adult and immature common terns were flying about or

resting on Long Island, and a few birds were fishing about Wantry. The terns on the bowldery shore at the east end of Long Island were accompanied by several ring-billed and herring gulls and by one adult and two or three immature Bonaparte's gulls. I found no nests, eggs or small young of the common tern on this date. Many adults were carrying small fish to full-fledged young that were in a compact group at one extremity of the island.

The presence of eggs in mid-June and at subsequent dates to August 2, lends some weight to the belief that two broods may be reared in a season. This may be the case where either the eggs or the young of the first nest may have been destroyed. Perhaps that was the situation here although it is not clear just what enemies might have interfered with the birds on this little island. Possibly a rise in the water level of the lake or high waves due to strong winds may have been responsible. The presence of small young on July 9, and the occurrence of half-incubated eggs on August 2, of the same season, further lends weight to the notion that the species has two broods. On the other hand it is possible that repeated disasters attend nesting efforts of the bird here, so that the breeding period is prolonged more or less—in individual cases at least. It is interesting to note that in the nests found during June, two or three eggs were the rule, while in the later nests there were only one or two. My view in the matter is that the first peak in egg-laying comes about June 15 while a second, lower peak occurs about five weeks later.

In common with most other terns the present species is timid and restless, and most of the incubation is performed at night. Both sexes take part in this duty. According to Jones (1906, p. 39), the period of incubation is twenty-one days. He states further that the birds brood almost constantly, and that little incubation results from the heat of the sun. Upon hatching, the young bird lies in an apparently exhausted condition for some time. It receives no food during its first day out of the shell and does not leave the nest until about the fourth day.

The young are fed by their parents until they are able to fly and fish for themselves. Some of the immature birds on Long Island were apparently attempting to secure food by wading out into the shallow water or by swimming a little ways from shore. For the most part, however, the young birds, some of them as large as the adults, preferred to be fed by the old ones and waited patiently for their food. As a parent, carrying a fish in its bill, approached a young one, the latter fluttered its wings excitedly and expectantly, screamed and threw back its head, with bill open to take what was offered by the parent hovering over it. As food was deposited in the wide-open waiting bill the parent darted away. Sometimes the parents alighted on the water beside the swimming or floating young birds and delivered the food from such a position. The young birds seemed to be constantly hungry and always in a receptive mood.

It is often stated that terns seldom swim or rest on the water, but my experience with the present species leads me to believe that, while it does so less consistently than the gull, perhaps, it nevertheless enjoys bathing and swimming or mere resting on calm water. About Long Island, both immature and adult birds were frequently seen standing in the shallow water or swimming singly

or in little groups. Much of the time gregarious tendencies of the bird are strongly in evidence.

The observations here recorded then, entitle the common tern to be ranked as an uncommon but a locally breeding summer resident in the Oneida Lake region.

The food of the common tern consists almost wholly of small fish, which it secures by plunging and diving. With deliberate beats of its long pointed wings and with downwardly directed bill the bird courses or circles at a height of thirty to fifty feet above the water. Suddenly it halts and dives downward, folding its wings as it enters the water and an instant later emerges with its prey. Again, the bird may hover for several seconds over a school of fish before making its dive. That these skilful fishers are not always unerring in their aim is illustrated by the one bird which I watched strike twelve successive times before it was successful in securing a fish. The strikes were made from a hovering position twenty to thirty feet above the water, in the shallows just off Long Island. All thirteen strikes were made within a minute, and no two at the same spot.

Adults in breeding plumage with pearl gray mantle, throat white, and breast and belly pale pearl gray. Tail deeply forked, white; outer vanes of outer tail feathers grayish, the inner vanes white. Bill red at base, the apical one-third black; legs and feet orange-red.

Black Tern. *Chlidonias nigra surinamensis* (Gmelin).

Although it is known to breed in the Montezuma marshes some thirty miles farther west, we have seen this rather distinctly interior species of tern only a few times in the Oneida Lake region during the summer months.

About 11 o'clock A.M., June 10, 1928, a flock of sixty or seventy individuals was observed flying back and forth and wheeling in complicated and concerted evolutions over Oneida Lake, near shore at Boysen Bay. Sometimes the birds flew in a loose group, then suddenly wheeling as a unit they formed a compact body just skimming the surface of the water. Occasionally one darted down quickly to seize an insect or a fish. After flying in one direction for a few hundred yards the entire flock turned again to retrace more or less closely the territory just covered. These tactics were continued for more than a half-hour. Probably the birds were feeding on mayflies which were issuing from the water in great numbers here at this time. So far as I could make out, all the members of the flock except two were in typical adult plumage. The two exceptions were birds still in winter plumage.

Although a sharp lookout was kept for this species during the 1928 season here and at other localities about the lake, especially in the great cat-tail marsh that is a continuation of the Cicero Swamp, one and one-half miles southwest of Clay, and a possible breeding place of this tern, it was not again seen until August 8. On the morning of that day, while rowing from Wantry to Long island, I saw an adult flying toward the latter island in company with a group of common terns. And on the afternoon of that day, just off Wantry Island, I saw another individual in immature plumage pre-empt for itself a perch in the form of a small



PLATE 2. COMPOSITE GROUP OF SHORE AND OTHER BIRDS ON WANTRY ISLAND

- 1: Spotted Sandpiper (3).
- 2: Common Tern.
- 3: Black Ducks (4).
- 4: Barn Swallow.

- 5: Common Tern.
- 6: Bald Eagle.
- 7, 8: Great Blue Herons (4).
- 9: Horned Grebe.

stick projecting from the water and occupied for the moment by a spotted sand-piper. The latter offered no defense.

Apparently the species is not often seen here, for an old resident of the region who for many years has been more or less interested in the birds of this territory, tells me that the June 10 record was his first sight of it anywhere near the lake.

About 7:15 P.M. on June 18, 1929, my suspicion that the black tern would be found at least casually in the great cat-tail marsh southwest of Clay, was confirmed when I saw three of the species there. Two of them settled down in the rushes, but the other continued its flight high in the air and toward the west. This was also my first record of it for the season. There is a possibility that the species nests here, the most likely place in the region, but I have no definite evidence.

This bird is, of course, most likely to be seen about Oneida Lake during its migratory movements. While it differs from our other terns in that it commonly is found in the interior, it also frequents the coasts more or less regularly, particularly in autumn. In spring it may be expected in the Oneida Lake region in late April. In the fall it occurs on most inland lakes of the State from mid-August to about October 1. It is a summer resident in the marshes at the east end of Lake Ontario as well as in the Montezuma marshes of New York State, and probably a few pairs may nest in the cat-tail marsh southwest of the village of Clay. The open patches of water, muskrat houses and the sparse cat-tail growth in certain parts of this swamp are features to attract it.

On the breeding ground this is a bold, aggressive and noisy bird. While studying nesting colonies in the lake districts of Northwestern Iowa I have been more or less disconcerted by their dashes at me, uttering their loud, harsh, oft repeated "*kak-kak*" in protest against my trespass on their domain.

In Central Canada the black tern is said to be one of the commonest birds of the flat grassy marsh country.

In the Sink Hole Marsh, a part of the old Montezuma Marsh in New York, Saunders (1926, p. 375), found it in only two localities, both in Wayne County. One small colony of seven or eight pairs was nesting.

The nests of this tern are often placed on old muskrat houses or on foundations of more or less submerged vegetable material in cat-tail swamps. Sometimes they are on the ground, partly hidden by swamp or bog vegetation. The usually scanty nest materials consist of a loose mass of reeds, grass or flags, forming a concave platform to support the eggs, of which 2 to 4 are the usual complement. The eggs vary in color, but some shade of buff predominates, and on this are heavy brownish marks, spots or blotches. Egg dates are given as follows by Bent (1921, p. 299): "Illinois and Iowa: Twenty-four records, May 11 to July 28; twelve records, June 6 to 18. Manitoba and Saskatchewan: Nineteen records, May 28 to July 5; ten records, June 6 to 14." Saunders (*loc. cit.*, p. 376), records "three downy young that could not have been many days old," on July 17, in the Montezuma Marsh.

The young usually remain in the nest for a few days, but can leave it shortly after hatching if occasion demands. They are fed by their parents until old enough to fly.

The food of the black tern consists of fishes, insects, crayfish, mollusks, spiders and the like. It is very expert on the wing and frequently captures such swiftly flying insects as dragonflies.

This tern seems possessed of great energy and a restless disposition, exhibited in its irregular, zig-zag, darting manner of flight and its wandering and erratic migratory movements after the breeding season. Its sociable and gregarious tendencies are not so well marked as in some other species of terns. And while it is a daring and noisy creature during the breeding season, it exhibits no marked belligerent tendencies toward the other marsh-inhabiting species. With the draining of many of the extensive sloughs and marshes throughout the country, this tern has been forced to withdraw farther and farther from centers of civilization into the outlying and still intact marshes of central British America where now the center of abundance during the breeding season probably occurs.

The black tern is easily identified, for in summer the adults have long, pointed, slate-colored wings and tail, and black head, neck and under parts.

ORDER COLUMBIFORMES

PIGEONS AND DOVES: FAMILY COLUMBIDAE

Eastern Mourning Dove. *Zenaidura macroura carolinensis* (Linnaeus).

Today this dove is probably the sole representative of the order in New York State and certainly in the Oneida Lake region. While more characteristic of the Carolinian and especially of the warmer portions of the Transition zone, it is only a moderately common summer resident in this territory, where I have found it chiefly in the low willow flats at Hitchcock Point and along the banks of Chittenango Creek near its mouth. Early spring arrivals from its winter home which, in the East, extends from North Carolina to Panama, may be expected in the latter part of March. The autumnal movement occurs in late October and in November.

Since the mourning dove is more characteristic of the open country, it follows that we should not expect to find it in any numbers in most of the area lying immediately to the north of Oneida Lake. Here only a pair now and then was seen in cleared areas in or near the woods or upon the dry treeless hillsides at Vandercamp or some similar situation.

The old willow trees that line the banks of the Chittenango and other creeks on the south side, the Hitchcock Point, the Shackelton Point, Fish Creek Landing, Cicero Swamp south of Clay, Hall Island and Shaw Point districts are favorite local retreats of this species. As a rule it is most abundant in the low, bottom lands along streams or in the vicinity of water where the commonest tree is willow, among the branches of which it finds suitable nesting places. In Cicero Swamp south of Clay the birds nest in the old willows scattered through the marsh and along its borders. This swamp too is a gathering place for the doves after the breeding season when flocks of some size may be seen flying across it in the evenings during late July and August. It should be added however, that the low boggy willow flats bordering Oneida Lake at such places as the north end of Big Bay, the Phillips Point district and the area of willow and alder just

west of Constantia are typical habitats in which nesting birds are to be found in some numbers.

That forested districts are not altogether shunned by mourning doves is shown by our finding it on May 31, 1929, in a dense maple and wild black cherry woodland a mile north of Cleveland. Also at other times during our studies we found it in wooded areas.

Regarding the status of the mourning dove in Madison County, in 1902, Maxon (1903, p. 264) says: "The bird is common all the way from the lowlands of Oneida Lake south along the Stockbridge Valley to Munnsville and to Eaton where I have repeatedly observed small flocks in the buckwheat fields. Out of more than 25 nests found the majority were in apple trees but occasionally in a pine, a white cedar, or, upon a fallen log."

The mourning dove is largely terrestrial and usually feeds in grass or grain fields or along highways. It often rests on the ground rather than in trees. On one occasion in the Hitchcock Point district I came upon a group of five sunning themselves on the floor of an old bridge that spanned a small willow- and alder-bordered creek. The flight is swift and direct and accomplished mainly by a rapid flapping of the long, pointed wings which, when the bird is getting under way, seem to strike each other above the back. The flapping is alternated with a certain amount of gliding.

In a recent paper by Taber (1930, pp. 17-28), data obtained through the banding method are presented to show that the autumnal migration of the mourning dove is general, and that birds nesting east and southeast of the Wabash River Valley, a sort of north-south division line, migrate only to Georgia. This would, of course, include the winter concentration area of the New York representatives of the species. Doves nesting west of the Wabash River Valley are found to migrate to Louisiana or Texas. Whether these data are sufficiently complete to warrant widespread application will be substantiated or modified through further investigations.

This dove is said by Eaton (1910, p. 388) to breed as early as April 20, but my earliest date is May 28, 1928, when several incubating birds were discovered in the old willow trees bordering and overhanging Chittenango Creek near its mouth. Most of these nests were less than four feet above the waters of the creek. However, on May 24, 1928, a man working on the beach at Lewis Point told me that on or about May 17, he had seen a nest with young in the woods near his place. On May 8, 1929, I saw a dove carrying nesting materials in the Shackelton Point district. Nests with incubating birds were recorded until about mid-June. It is altogether probable that two broods are reared in a season. All the nests that I have found here have been in willow trees in the low flats near water.

Sadler (1926, p. 8) gives May 9, 1912, as her earliest nesting date.

Like the nest of the black-billed cuckoo, that of the eastern mourning dove is a rather precarious assemblage of sticks and grass, sometimes with a lining of grass or moss. As suggested by Maxon (1903), a variety of sites may be chosen, from the ground in an open field to a crotch fifty feet up in a tree. The two eggs are pure white.

The incubating period is said to range from fourteen to fifteen and a half days, and the young remain in the nest for from twelve to fifteen days. It is said that mated pairs remain together throughout the season and that the male takes part in such domestic activities as incubation, feeding the young and brooding. As ornithologists well know, the young are fed by the process of regurgitation, whereby the substance known as "pigeon's milk," a whitish fluid which originates from certain cells lining the walls of the crop, is ejected by the adults into the throats of their altricial progeny.

The mournful cooing of this bird cannot be mistaken for the note of any other, and is responsible for the common name of the species. It usually begins "with a higher-pitched note, slurring first upward and then downward, and ending with three or four notes low in pitch and slurred downward. It may be written "ooce-ccah-coo-oo-coo-coo-oo." (Saunders, 1923, p. 326.)

The mourning dove is mainly vegetarian in food habits, for studies made by the U. S. Biological Survey show that less than 1% of the food consists of animal matter. About 35% of the vegetable substance consists of grain, such as wheat, oats, corn, rye, barley and buckwheat, most of which is waste found in the fields, along roadsides or in stock pens. The seeds of noxious weeds make up the remainder of its food.

In the Lakeport district in mid-July I have seen the birds in numbers in fields of newly sprouted buckwheat. At this season flocking takes place and groups of five to ten are often seen flying over the swamps, or congregated in the fields.

Time without number this dove has been mistaken for its more famous but now, so far as known, extinct relative the passenger pigeon. However, the smaller size of the mourning dove, which averages four inches shorter than the passenger pigeon, the presence of a bluish black spot below the ear, and the olive-brown instead of slaty blue upper parts should serve to distinguish the present species.

ORDER CUCULIFORMES

CUCKOOS, ANIS, ETC.: FAMILY CUCULIDAE

Black-billed Cuckoo. *Coccyzus erythrophthalmus* (Wilson).

The black-billed cuckoo is a moderately common summer resident in the Oneida Lake region, found breeding in the bushy tangles at various points all about the lake, but especially to the north and east of it. The first spring arrivals put in their appearance early in May—my earliest record is May 12, 1929—while the return to the winter quarters in South America begins in late September and continues through the first half of October.

This slender, soft-plumaged, stealthy bird is commonest locally in the outlying swampy thickets and the bushy, vine-covered growths along fence rows, such as occur in the Fish Creek, Cleveland, Cicero Swamp south of Clay, Bernhard Bay, Constantia, Oak Orchard and Verona Beach districts, as well as at Hitchcock Point, the Parker woods and other localities south of Lakeport and Oneida. During the breeding season the black-billed cuckoo appears to be commoner

throughout the north side district than in the territory south of the lake. In late June we found it rather frequently in the outlying sparsely settled districts about Constantia Center and the Vandercamp woods. The low maple saplings and seedlings and the extensive growths of willow and alder thickets that so commonly border the swamps everywhere are also favorite resorts of this bird. It seems to be partial to lowland thickets.

One can not help admiring this slender, graceful woodland bird as it flies furtively from a perch at the margin of a thicket into the denser foliage where it blends well with its surroundings. It has a calm and stately demeanor that at once impresses and relieves the weary observer who has, perhaps for hours, been trying to follow in the branches of tall trees some nervously flitting and seemingly tireless Blackburnian or black-throated green warbler.

There has been considerable discussion concerning the differences in the notes of our two species of cuckoo, some writers declaring that they can without fail distinguish them by the voice alone. For myself, I must admit that I can not do so always with certainty. The long guttural notes "*kuk-kuk*," repeated many times and ending with the syllables "*kyow, kyow*" repeated several times, perhaps describe the nature of the call in a general way. The notes of this bird are somewhat softer and less harsh than those of the yellow-bill.

"The notes of this Cuckoo differ from those of the yellow-billed both in time and quality. They have a soft gurgling sound like '*glug*' rather than '*cuk*,' and are grouped in pairs or three's repeated at even intervals of time. '*Glug-glug glug-glug*' or '*Glug-glug-glug glug-glug-glug*,' with one note of each group accented, and the whole repeated over and over, will represent the song." (Saunders, 1923, p. 325.)

Not infrequently we heard the note of the black-billed cuckoo in the region at night.

It is a popular belief that vocalization by the cuckoo presages rain; hence its colloquial name "rain crow."

Owing to its quiet, retiring disposition and unobtrusive habits the black-billed cuckoo is not frequently seen, particularly during the breeding season. The nest, a small, frail platform of sticks lined with dry leaves, grasses and plant down, is usually constructed in a shrubby tangle or a small tree or bush at a height of two to ten feet above the ground, and is well concealed by the surrounding foliage. The three to seven bluish green eggs, deposited at intervals of two or three days, are likely to be found from late May to early August. On one occasion in northern Michigan I found freshly laid eggs and well-fledged young in the same nest.

As early as May 17, mating birds were observed about Oneida Lake. My earliest nesting record is May 22, 1928, when a bird was flushed from a nest containing one egg, situated about three and one-half feet from the ground, in a low bush in the West Monroe district. As late as August 8, adults were observed carrying food to young.

Caterpillars, beetles, grasshoppers, hymenopterans, bugs and spiders make up a large share of the food of both the black-billed and the yellow-billed cuckoo. Such hairy and spiny forms as the tent-caterpillar, the spiny elm caterpillar and

the larvae of the tussock, gypsy and brown-tail moths, all of which are commonly shunned by other birds, are taken freely by both species of cuckoos. We have observed the black-billed cuckoo feeding upon the larvae of tent-caterpillars in June. While this cuckoo feeds upon a variety of destructive forms, its chief claim to consideration from an economic viewpoint lies in the extraordinary number of destructive spiny and hairy caterpillars that it destroys. In this respect it is of particular value to the horticulturist and the forester.

Mr. Eaton, a farmer living about two miles south of Lakeport, told me that he considered the "rain crow" a beneficial bird because it destroys the "worms" that feed on apple trees. That its usefulness thus is recognized among farmers on the basis of their own observations is encouraging and indicates a healthy popular sentiment toward a valuable insectivorous bird.

The soft grayish brown upper and plain white under parts, blackish bill,—lower mandible included—the black tail-feathers narrowly tipped with white and the red eyelids will serve to distinguish the black-billed cuckoo from its congener. The latter has the wing feathers largely rufous, the outer tail-feathers black conspicuously tipped with white, and the lower mandible yellow except the tip.

ORDER STRIGIFORMES

TYPICAL OWLS: FAMILY STRIGIDAE

Eastern Screech Owl. *Otus asio naevius* (Gmelin).

The screech owl is recorded by Eaton (1910, sec. 3) as a common resident in all four of the counties surrounding Oneida Lake, namely, Madison, Oneida, Onondaga and Oswego. However, in my two summers' experience here I have never seen the bird in the field and have heard it on only one occasion. On the night of July 6, 1928, at our quarters near Lower South Bay, I distinctly heard the characteristic weird, wavering trill of this little owl not far away. Local residents tell me that the bird is heard more frequently in autumn, but the general opinion is that it is not a common local species.

Perhaps on account of its small size and its tendency to remain concealed during the day the screech owl is frequently overlooked. It is chiefly crepuscular and nocturnal so far as its general activities are concerned, although in Iowa I have frequently seen it flying about during the day. It often occurs in the vicinity of farm buildings and in old orchards as well as in more thickly wooded districts. I fully expected to find it about some of the abandoned farm buildings and orchards in the Oneida Lake region, but in this I was disappointed. Even in large cities the species is frequently found.

This is one of the birds that readily respond to man's efforts in providing breeding places, and will occupy suitable nesting-boxes about buildings as well as hollow trees or deserted woodpecker holes. Mating takes place in late March and April, and the usually four or five white eggs are deposited some time during the latter month.

Usually the eastern screech owl remains concealed in a hollow tree or in a dense evergreen or other tree growth during the day. Sometimes its presence may

be discovered through the outcries of blue jays or crows. If approached in the day time it often does not move from its perch but attempts to discourage an attack by a sharp snapping of its mandibles. As evening comes on the bird begins to utter its mournful, tremulous call which is not at all in the nature of a "screech" but rather of a trill or whistle. It is at this time, too, that its feeding activities are resumed.

From studies of the food habits of the screech owl made by the U. S. Biological Survey it has been found that the principal items in this bird's bill of fare are beetles, grasshoppers, crickets, moths, spiders, crayfishes, small rodents such as mice of several species, house rats and flying squirrels, frogs, lizards and earthworms, and last but by no means least, small birds of which English sparrows form a conspicuous part. While the English sparrows, perhaps, could well be spared, some of the native species taken are beneficial.

In an investigation of the food habits of the screech owl in New York State conducted by Allen (1924) and covering a period of forty-five days during the season when young were in the nest, remains of birds were found in the food on thirty-five days, insects on twenty-eight days, crayfish on twenty-four days, amphibians on fifteen days, mammals on twelve days, fish on six days, and spiders, snails and reptiles on one day each. Individual birds to the number of 98 and representing twenty-four species were secured for the young by the adult owls.

While it is probably true that during the major portion of the year the food habits of the screech owl warrant placing this bird in the beneficial group, it can not be denied that its record in the destruction of valuable small birds, particularly when it has young in the nest, leaves something to be desired. However, the screech owl's inroads have probably no appreciable influence on the aggregate numbers of our small birds.

The small size and conspicuous "horns" or ear-tufts will serve to identify this species, but many persons are unaware of its two color phases, the red or rufous phase in which the upper parts are bright rufous or rust-red finely streaked with black, and the gray phase in which the upper parts are brownish gray finely streaked with black and mottled with buff. These color phases are not peculiar to age, sex or season and both red and gray phases may be represented in different individuals of the same brood. It is probable that the gray phase is the prevailing one in New York State.

Great Horned Owl. *Bubo virginianus virginianus* (Gmelin).

In New York State this large owl is a permanent resident, but so far as the Oneida Lake region is concerned it seems to be a rather uncommon bird for I have seen it in only one locality, the tall hardwoods near the mouth of Chittenango Creek. During the 1928 season a pair nested here in a hugh elm tree standing in the low, wooded swamp about 150 yards from the lake shore. The high waters of early spring completely flood this rather densely wooded tract which is not visited often by humans.

Upon my arrival in Syracuse in late April, Dr. C. E. Johnson called my attention to the nesting of the species here, but it was not until May 15 that I dis-

covered the bulky stick nest some sixty feet above the ground. On this date the nest was intact and one downy young bird sat on a limb twenty feet above it. No other individuals of the family were to be seen. The area about the base of the tree was thoroughly bedaubed with the excrement of the birds, but little could be told of the food that had been taken. A piece of skin of what appeared to be a mud-puppy (*Necturus*) was the only thing that I could identify.

On June 7 and again on July 3, I saw a single great horned owl here. Both times it was tormented by a group of noisy crows. During the 1929 season I saw only one horned owl here (June 13), but the old nesting tree was not occupied. However, it is likely that a pair nested somewhere in the vicinity for several times I heard the characteristic racket among the crows.

At the hunters' cabin on the F. C. Soule estate is a mounted specimen of an adult great horned owl taken on the estate grounds in June, 1927. And in the window of a dwelling house at the village of Fish Creek Landing I saw a mounted specimen, doubtless collected locally. Although these constitute my only local records for the species it is altogether probable that it nests sparingly in the extensive wooded ravines on the north side of the lake as well as in the little frequented swamps of the area.

That this bird can see well in daylight is well known, and indicated by the familiar fact that it usually has sighted the observer and flown away into the forest before he has seen it. I suspect that this is partly accountable for the few sight records I have here. The deep-toned and far-reaching "hoot" of this owl consisting of six evenly intoned syllables, is quite distinctive and is likely to be confused only with that of the barred owl.

Eggs of the hardy great horned owl are commonly found in February and March; the complement is two or three and they are usually deposited in a hollow tree or in an old hawk's or crow's nest.

This predacious bird is largely nocturnal in its habits. On account of its habit of attacking domestic fowl it has been continually a target for farmers and poultry raisers, with the result that its numbers have been considerably diminished and the survivors have become largely permanent inhabitants of the deeper and little frequented forests. Rabbits, field mice and other small mammals make up a large portion of this bird's diet; domestic poultry and game birds together with some of the smaller land and water birds also constitute an important item of food while large insects make up the remainder. Its destruction of poultry and game birds is balanced in some measure by the considerable numbers of destructive rodents taken, so that in many localities it can be considered a beneficial species.

The long erectile ear-tufts or "horns," the ochraceous buff upper parts and the conspicuous white throat-patch are good field characters.

Saw-whet Owl. *Cryptoglaux acadica acadica* (Gmelin).

It was with some surprise that I came upon the little saw-whet owl in the so-called Parker woods near Smiths Ridge, one and one-half miles southwest of the village of Lakeport, on the morning of July 3, 1929. Ordinarily this bird prefers rather dense swampy woodland where it may remain concealed

during the day, and this was the type of habitat in which I discovered the single individual, perched on a small limb of a hemlock tree close to the trunk and well hidden in the semi-darkness of the drooping boughs. It was about fifteen feet from the ground and how my eyes happened to meet its staring yellow ones as I made my way over the boggy ground, among the ferns and ground hemlocks and maple, birch, elm and ash seedlings, I do not know. This woodland is part of a continuous fifty-acre tract paralleling Oneida Lake and a mile and a half south of it. A large portion of the woodlot is not pastured and not often visited by humans. Incidentally, it represents the type of wooded tract that can well be converted into a refuge and breeding ground for birds and other wild animals.

The owl that I saw here was evidently a bird of the year, for while it had numerous distinct white streaks on the front of the head forming a V between the eyes, the under parts were a plain chocolate brown and the tip of the bill was blackish.

I teased the bird a little and it responded by snapping its bill sharply a few times, then flew to a tree fifteen or twenty feet away and there I left it. This owl is well known for the ease with which it can be approached in the day time, when it prefers to sleep the hours away in some darker portion of the woodland. An adjoining stumpy, cleared tract offered a feeding ground close by where field mice and large insects, its favorite food, might be secured. Judging from the intermediate condition of the plumage of this bird, the species evidently breeds in this locality.

The so-called saw-whet or Acadian owl is usually considered a rare or at least uncommon bird in most parts of the State. Possibly its small size, secretive habits, irregularity of movement and general inconspicuousness have conspired to conceal its true status. In autumn especially these birds wander about more or less in search of food. While the species probably occurs regularly though sparingly in most parts of the State it is commonest in the Adirondack region. Concerning its nesting in this region, Eaton (1914, p. 119) mentions only Ralph and Bagg's record of "5 sets of 6 and 7 eggs from Oneida and Herkimer counties, the dates ranging from March 25 (1886) to April 30 (1889)."

This is the smallest owl occurring in the State. It may otherwise be distinguished by its lack of ear-tufts or "horns," its finely streaked head and plain buffy white feet and legs. The common name "saw-whet" is given the bird because of its scraping or rasping notes which have a fancied resemblance to the sound produced when a saw is being filed. This note is most likely to be heard during the nesting season.

ORDER CAPRIMULGIFORMES

GOATSUCKERS: FAMILY CAPRIMULGIDAE

Eastern Whip-poor-will. *Antrostomus vociferus vociferus* (Wilson).

It is probable that of a hundred persons selected at random not more than ten would be able to identify this bird in the flesh even though a close-up examination were permitted. On the other hand it is quite likely that ninety out of the hundred would at once recognize its characteristic call if they should hear it.

Personally I have never actually seen a whip-poor-will in the Oneida Lake region but I have heard it on several occasions. While much favorable habitat exists, particularly on the north side of the lake, my experience is that this species can not be called a common bird in the region. Local residents are unanimous in their statements that the bird is much less common here now than it was a few years ago. Just why this might be so I do not know.

During the 1928 season I heard the bird only in the Cleveland district, but I am sure that if night excursions had been made to other wooded sections on the north shore of the lake it would have been heard in at least some of them. On the evening of June 14, we drove to the extensive hemlock-maple woods in the rolling country about a mile north of the village of Jewell, where local residents told of having heard the calls of the whip-poor-will some two weeks earlier. At about 8:30 o'clock the birds began calling. We heard several, but their notes were not particularly energetic. The number of calls given without intermission by an individual bird ordinarily ranged from eight to twelve or forty. One individual uttered the characteristic call forty-nine consecutive times without pause.

In the 1929 season I first heard the whip-poor-will on the evening of May 12, from our field quarters at Lower South Bay. Mrs. Stoner also heard the call a little later. It seemed to come from the woodland south of the golf links of the Syracuse Yacht and Country Club, three-fourths of a mile distant. About midnight of May 29, I heard the bird calling in the woods just north of the village of Cleveland. A week later I again heard it in the Cleveland district.

On May 10, I talked with a man living in the wooded and hilly section about four miles north of Cleveland. He said that he had heard the whip-poor-will only once or twice this season. A few years ago the species was much commoner, he said, and early in the morning the birds would often alight on the tops of the houses in the vicinity; from this point of vantage they uttered their calls to the discomfiture of persons who wanted to sleep.

On the evening of June 28, we drove to the wooded section of the Cicero Swamp two miles south of Bridgeport and then on toward the village of Col-lamer, stopping at several places to listen for the whip-poor-will. But we heard none here nor at the Cicero Swamp southwest of Clay, nor in an isolated woodland two miles northeast of this village. A local resident living two miles south of the village of Oneida Lake said that the whip-poor-will sometimes is heard in that vicinity and that he had heard it on June 25. Mr. William Parker, living one and one-half miles southwest of Lakeport, tells me (July 3) that he has seldom heard the bird this season, the last time about ten days ago. A cottager at Shackelton Point said that he had heard the bird on several nights during the summer as he had driven through the Cicero Swamp south of Bridgeport.

Concerning the whip-poor-will in the Oneida Lake region, Sadler (1926, p. 10) reports as follows: "Saw and heard one up Fish Creek, Oneida Lake, on June 19, 1920. Flushed a male in woods at Constantia on May 13, 1922. The next day flushed two in piece of woods north of the village. May 20, 1923, flushed one in exactly the same place and again on May 27, 1923. On May 18, 1924, flushed another male in the identical place." Maxon (1903, p. 264) says:

"Included by Mr. Embury only in his hypothetic list. A common summer resident, however, in the low woods about Oneida Lake, particularly at Lewis Point."

The available data indicate, therefore, that while the whip-poor-will occurs and doubtless breeds in the region, it is by no means common and its distribution is limited to the more heavily forested sections north of Oneida Lake.

The whip-poor-will is likely to appear in spring from late April to early May. In autumn the last birds leave for the South in late August and early September.

Shady forests afford the type of habitat most frequented by this bird. Here it remains concealed during the day, resting on the leaf-covered ground or lengthwise of a limb, the coloration of its plumage blending so harmoniously with the surroundings that the bird is difficult to see. When approached it rises suddenly and, flying low and noiselessly, lights again not far away. Its activity is greatest in early evening when it comes from its retreat to feed. Its diet consists entirely of insects, taken on the wing. Moths, leaf-feeding, wood-boring, dung and carrion beetles, nut weevils and mosquitoes are some of its favorite items of food. More than forty moths have been taken from the stomach of a single bird.

It is at night also that the whip-poor-will utters its well known call, "*whip'-poor-will'*, *whip'-poor-will'*", from which is derived its common name. The rapidity with which the call is uttered and the number of repetitions with little or no interruption is rather remarkable.

Some years ago (1920) at Douglas Lake, in northern Michigan, I made a number of counts of the consecutive calls uttered by this bird. Certain of the results are of interest in that they illustrate rather unusual vocal ability. On July 1, at 5:00 A.M., 369 consecutive calls were uttered by a single bird. On July 5, at 9:00 P.M., 396 consecutive calls, interrupted by three very short intervals, were given; and on July 12, at 5:00 A.M., 710 consecutive calls interrupted by four brief intervals were counted.

The whip-poor-will makes no nest but lays its two eggs on the ground or in a slight depression among the dried leaves, usually in thickets. In Michigan I found eggs on dried leaves among the sparsely growing small aspens in a cut-over tract. Similar types of habitat north of Constantia and Cleveland in the Oneida Lake region should prove attractive to these interesting and useful birds.

The mottled brown, black and white plumage, the white tips on the three outer pairs of tail feathers and the narrow white band across the upper breast will serve as distinctive marks for the whip-poor-will. In addition, the rounded tail, the absence of white patches on the wing and the more highly nocturnal habits will also aid in distinguishing it from the nighthawk with which it is sometimes confused.

Eastern Nighthawk. *Chordeiles minor minor* (Forster).

Eaton (1914, pp. 167-168) makes the following statement concerning the nighthawk in the Oneida Lake region: "Various observers have reported great scattering troops of thousands and thousands of nighthawks from the vicinity of Oneida Lake and from Chautauqua county during the month of August. These flights usually progress in a southwesterly direction." Although the period of my observations here was concluded on August 15, I have not been fortunate

enough to see as many as a dozen birds in the vicinity of the lake during my two seasons' field work. However, I have seen the species more frequently flying about over the city of Syracuse. Maxon (1903, p. 264) says of the nighthawk: "'Of rare occurrence', and only two records given by Mr. Embody. The bird is a common summer resident in the vicinity of Oneida and by Oneida Lake; it may be heard almost any early evening."

In the 1928 season I recorded the species for the first time on June 7; two birds were flying above the woods near the mouth of Chittenango Creek. Not until August 6, when I saw several individuals flying over the downtown section of Syracuse, was the species again noted. On August 8, about dusk, I heard the loud nasal "*peent-peent*" of a nighthawk as it flew over our field quarters at Lower South Bay.

Until August 7, when a single individual was seen flying above the Cicero Swamp southwest of Clay, I had not recorded the nighthawk in the Oneida Lake region during the 1929 season; but on June 12 I had seen several flying above the city of Syracuse. On the evening of May 14, 1930, I again heard several of these birds uttering their familiar note, as they circled above the city. All through the summer the birds were to be found in this district, their sharp calls often being heard as early as 5:00 P.M. and at intervals throughout the night.

I am at a loss to explain the almost total absence (apparently) of this bird in the Oneida Lake territory during the summer months, although it is possible that it occurred in some numbers later in August after I had left the field.

The nighthawk, which is not a hawk at all but a close relative of the whip-poor-will, may be expected here some time during early May. In autumn it is last seen in September. It is reported as a summer resident from all parts of the State, but it breeds only locally. "In the wilder portions of the State it still nests on the rocks and the rugged fields, but in the more thickly inhabited districts, on the flat tops of buildings." (Eaton, *loc. cit.*, p. 167.)

The two eggs of the nighthawk are usually laid on the bare ground in a waste field or in a bare area in the woods. For some reason the gravel-roofs of higher buildings in cities appeal to these birds as a place to lay their eggs, and numerous instances are on record.

While the nighthawk is more or less crepuscular and nocturnal in its habits, it is abroad a good deal during the day, too—in contrast to the whip-poor-will. Apparently the bird is more likely to be seen in the present territory, in late summer rather than at any other time, but its movements appear to be exceedingly erratic. At Douglas Lake in northern Michigan I have observed great numbers of these birds flying about in early evening during the first days of August. Flight is characterized by slow, deliberate beats of the long pointed wings, but this is frequently alternated by rapid darting movements and by soaring at brief intervals. At this season, as well as in the mating season, the birds often rise rapidly to a considerable height, then dart headlong toward the earth, suddenly arresting themselves at the end of the swoop and gliding upward on stiffened wings. The rush of air through the wings at the end of the swoop produces a dull vibrating sound that can be heard distinctly. The primaries are crossed

obliquely by a broad white band which appears as a hole in the wing when the bird is in flight.

Nighthawks are likely to be found in both open and wooded country. In the former situation they roost and nest upon the ground. In wooded districts they perch during the day in trees, resting lengthwise on a limb. Several times both in Iowa and in Michigan I have at first taken a bird resting in this way for a thickened or gnarled part of a branch. The blackish and grayish plumage more or less spotted with white and dusky renders the bird quite inconspicuous under such conditions.

From an economic viewpoint this wholly insectivorous bird is very beneficial. Flying insects, which are taken mostly in early morning and in the dusk of evening constitute the bulk of its food. Such annoying or destructive forms as two-winged flies of various species, moths, wood-boring, leaf-feeding and bark beetles, and carpenter and other ants have been found in the stomach examinations of nighthawks. McAtee (1926, p. 104) records the taking of 650 plant lice from the stomach of a single individual.

The generally grayer plumage, the longer and more pointed wings each with a conspicuous white patch, the forked tail and the white *throat* band are characters helpful in distinguishing the nighthawk from the whip-poor-will.

ORDER MICROPODIIFORMES

SWIFTS: FAMILY MICROPODIDAE

Chimney Swift. *Chaetura pelagica* (Linnaeus).

Often though improperly called "chimney swallow," this highly aerial bird, which shares some of the characteristics of the swallows, is a very common summer resident of the Oneida Lake region. It arrives from its winter home south of the United States late in April or early in May. My earliest record for 1928 is May 12, when several individuals were seen at Bridgeport; and for 1929, May 2, when six were seen circling above the Cicero Swamp southwest of Clay. The species is unable to stand much cold, so that the autumnal movement begins in late September or early October.

From the time of its earliest arrival, when it is often seen feeding on the wing with barn, tree, bank and cliff swallows, about the lake and the streams that flow into it as well as above the numerous villages that dot the landscape, until the end of the summer, its aerial evolutions and rapid chatter are a constant reminder of its presence. As the season advances the swifts exhibit a marked preference for the wooded sections and the villages to the north of the lake. Possibly this is because these centers of population are, for the most part, larger than those on the south side and hence have a greater number of old chimneys to offer; and, too, the greater areas of older and heavier timber together with the considerable number of abandoned farm houses in the district offer greater possibilities for nesting sites than do the more open situations about Bridgeport, Lakeport and South Bay. As a matter of fact the Cleveland district seems to be the center of abundance of the species locally, with the Constantia, Jewell, North Bay, Brewerton and Bridgeport districts following next in order. I believe that

the principal attractions for these birds in Cleveland are the huge brick chimney of an abandoned factory and a large unused smokestack. At Constantia, on May 21, 1929, I saw numbers of the birds entering the large unused chimney of an old but occupied house. In early June I saw the bird in some numbers coursing over Panther Lake, in company with barn, cliff and tree swallows.

In flight ability this bird exceeds most of our other species. Although its wing beats are very rapid, it alternates flapping and sailing in such a judicious fashion that it never seems to tire, for it is on the wing zig-zagging, gliding, wheeling and turning from early morning to late evening. Frequently groups of some size may be observed executing complicated aerial movements in perfect harmony and without collision or interference of any kind.

In early August many of the flying birds exhibit vacant spaces in the wing expanse due to loss of primaries through molt. As a result, the wings have a ragged appearance, but this seems not to impair their flight.

In contrast to the wings, the feet of the swift are small and weak and not fitted for perching but the long, slender claws are well adapted for clinging to a vertical surface while the body is supported by the short, spiny tail feathers. In this position the birds cling to the inner surface of a hollow tree or chimney, or to the side of a building, to rest and sleep. Sometimes only a few, again several score or even several hundred may group together in some favorable roosting place.

While these birds are more commonly abroad in morning and evening they may be observed at almost any hour of the day during the breeding season. They are particularly active on cloudy days and immediately preceding or following a storm.

The voice of the chimney swift is harsh and unmusical. It consists of a loud "*chit-chit*" which may be repeated slowly a number of times, with an appreciable or considerable pause between the notes, or it may be repeated rapidly in a sort of chattering cry. Often several birds flying about together utter the notes alternately or synchronously.

Swifts bathe, drink, feed and mate on the wing, and in late May or early June construct a semicircular bracket-like nest of dead twigs in a chimney or dark closet or attic of an abandoned house, in a cave or on the interior of a hollow tree. The bird secures the twigs by flying against them and breaking them off, then seizing them with bill or feet carries them to the nesting site. Here they are glued to one another and to the support by a sticky secretion produced by the salivary glands of the bird, which are unusually active at this season. From four to six white eggs are deposited in this unlined structure. Incubation is shared by both sexes, and is said by Burns (1915, p. 284), to require eighteen days.

Although I searched in vain for nests of the chimney swift in a number of outlying abandoned farm houses in the Cleveland district, and at other places, my faith that the bird breeds in the vicinity was substantiated on June 27, 1930, when Mrs. H. T. Van Cleave informed me that a pair was building a nest in an old barn, used as a garage, near their summer cottage about a mile north of

the village. On July 14, a clutch of eggs had been deposited and incubation was in progress.

Chimney swifts feed chiefly on flying insects, such as flies, beetles, flying ants, bugs, grasshoppers and the like. Spiders also are taken. "Swifts are believed to feed entirely on flying insects, but my experience in watching them inclines me to the belief that they sometimes take small caterpillars that, spinning down on long threads from the branches of trees, are blown about by the wind, and they may even pick one occasionally from the leaves." (Forbush, 1927, p. 314.) Without doubt the chimney swift is a highly beneficial bird.

The dark, sooty coloration, long wings, short, square tail with shafts projecting beyond the vanes in the form of sharp spines, and the rapid wheeling flight and chattering note all aid in the ready identification of the chimney swift.

HUMMINGBIRDS: FAMILY TROCHILIDAE

Ruby-throated Hummingbird. *Archilochus colubris* (Linnaeus).

This pleasing and smallest member of our bird population arrives in the Oneida Lake region from its winter quarters in southern Florida, Mexico and Central America the second week in May. My earliest date is May 11, 1929, when about seven o'clock in the evening I saw a male ruby-throat feeding at some golden currant (*Ribes aureum*) growing at our field quarters at Lower South Bay. Incidentally, it may be remarked that this ornamental bush which flowers early in April and May offers particular inducements to this bird. Usually the male ruby-throats arrive a few days in advance of the females. Hummingbirds are likely to be seen in the Oneida Lake region until late in September.

The species is a fairly common summer resident in the region and seems to show no predilection for one side of the lake over the other, for it occurs in cut-over areas, about low bushes in open places in the woods and about cottages and farmyards throughout the territory under consideration. I have found the ruby-throat particularly common in the second-growth a mile east of the village of West Monroe and north of the State highway. In late May and early June the fragrant blossoms of the sweet crab (*Pyrus coronaria*) and thorn apple (*Crataegus pedicellata*), which form a sparse thicket here, attract these birds and we could always be sure of finding several of them feeding and resting upon the limbs of the low trees as well as on the barbed wire fence surrounding the tract.

Other places where I have found this bird in some numbers include the Vandercamp woods, and Verona Beach, Big Bay and Cleveland districts. It is not at all gregarious or given to forming groups but frequently a favorable feeding place will attract several individuals.

A good many popular misconceptions are abroad concerning the habits and activities of the ruby-throat. One of these is to the effect that the bird is constantly on the wing except when it is on the nest. More careful observers of birds know, however, that the hummingbird lights to rest and to preen its plumage just as do many other species. At the place just mentioned above, a hummingbird once perched on a fence not more than ten feet from me; it seemed quite unafraid and after eyeing me intently for a half-minute flew away.

Another misconception concerning the ruby-throated hummingbird that has gained wide credence is that its food consists solely of the nectar of flowers. While it does take some nectar in its visits to flowers its principal subsistence is derived from the small insects such as Hymenoptera, leaf hoppers and plant lice which occur on them. The hummingbird frequently hovers over cultivated flowers and many people see it only under these circumstances. Most of the blossoming trees also are visited. Among other plants on which I have seen the hummer feeding here are the blossoms of columbine and red clover. On August 13, at Verona Beach, I saw a female among the needles of a tall white pine tree; apparently she was feeding on the exuding sap or the minute insects attracted to it, or both. In addition to its beneficial qualities in destroying small noxious insects is the hummingbird's service in the cross pollination of flowers.

The ruby-throated hummingbird often nests about human habitations as well as in wilder and wooded situations. Old apple orchards are favorite haunts; and sometimes the nest is built surprisingly close to a center of human activities. At one of the summer cottages on the lake at Lower South Bay, which was occupied by the owner from late spring and throughout the summer, a pair of ruby-throats built a nest in an apple tree. It was placed toward the tip of a drooping limb ten feet from the ground and perhaps twenty feet from the back door of the cottage, where members of the family came and went at frequent intervals. The nest was saddled in the horizontal crotch of the limb, well toward its upper side so that it was scarcely visible from below. The usual plant down bound together with spiders' webs and external covering of lichens and moss comprised the materials of the nest. It contained two white eggs. I do not know just when the eggs in this nest were laid, but the young birds left it on July 23. I believe they are ordinarily in the nest about twenty days. This is a rather late nesting record, for most of the young have left their homes a month earlier. I have records of the nesting of the species in June, in a farm-yard one and one-half miles northwest of Vienna, in the village of Cleveland and in apple trees at Lower South Bay.

While the flight of the hummingbird is rapid—the wings are said to beat 600 times a minute when the bird is in full flight—the small size of the species gives an exaggerated notion of the real speed of this “glittering fragment of the rainbow.” From thirty to fifty miles an hour is the maximum speed. Hayes (*The Auk*, Vol. 46, No. 1, 1929, p. 116) records an example of an individual keeping pace with an automobile going at the rate of forty-five miles an hour. The hummingbird excels at hovering, which is possible only because the wings can be driven so rapidly. The dull hum or whirr of the wings thus vibrating is the basis for the common name hummingbird. Several times when I have been walking in a sparse open woodland I have heard the low hum of its wings as the bird shot past me while I was looking in another direction. The species has no song, its vocal powers being confined to a few low, squeaky notes which the average bird watcher seldom or never hears.

Hummingbirds are pugnacious creatures and despite their small size will sometimes attack a blackbird, a crow, or even a hawk or a man, particularly if any of them intrude upon the nesting site.



Fig. 193. Nest and eggs of common tern on Long Island.
August 2, 1929.



Fig. 194. Burrow of eastern belted kingfisher in sand pit one mile north of
Jewell. June 8, 1929.



Fig. 195. A family of young eastern belted kingfishers. Upper row photographed on June 16, 1928 when about three weeks old. The birds have been banded. The middle rows show different poses of the same family on June 23. The lower shows the family as photographed on June 27.

In addition to the small size and slender, attenuate bill, the ruby-throated hummingbird may be distinguished by the bright metallic green of the upper parts. The male has a metallic ruby-red throat patch or gorget, but the throat of the female is whitish.

ORDER CORACIIFORMES

KINGFISHERS: FAMILY ALCEDINIDAE

Eastern Belted Kingfisher. *Megaceryle alcyon alcyon* (Linnaeus).

Of all the birds that are ordinarily found in almost any well watered territory in eastern United States none is more characteristic or uniformly present than the belted kingfisher. This statement also is true, in general, for this species in the Oneida Lake region, for while it can scarcely be called a common bird here it is generally distributed in the immediate region of the lake as well as about the outlying smaller lakes, ponds and streams. The bird was seen on practically all of our field trips, so that an enumeration of the places in which we have seen it in the region would include every field station about the lake, including Frenchman and Dunham islands, Cicero Swamp southwest of Clay, Big Bay Swamp and the Oneida River in the Oak Orchard district as well as the numerous other lakes and ponds visited during the course of our study. However, I have found it more commonly on the north side of Oneida Lake, for in addition to the ponds and lakes there found the precipitous banks of Oneida Lake itself and of gravel and sand pits that have been left here, offer suitable nesting sites for the bird. The Fish Creek district also offers attractions as to feeding places and nesting sites. I have never observed it on the treeless Wantrý and Long islands. Early of a morning I have seen a kingfisher flying down the length of Main Street in the village of Cleveland, chattering as he flew.

While the belted kingfisher sometimes remains over winter in parts of the State where open water is to be found at that season, it is a summer resident only in most localities, arriving from the South in late March and early April. Most of the birds leave in late October and November. From late July on the birds become much less noisy and their harsh rattle is not so often heard as earlier in the season.

Either flowing or still water satisfies the kingfisher as a feeding place so long as it contains fish. Usually it perches on a dead limb, a piling or other high vantage point above the water, from which it may sight its prey below and gain momentum for a quick dive to seize it. In the act of capture it drops like a plummet to the water, sometimes merely breaking the surface to grasp the fish; again the entire body is immersed for an instant when the intended victim is swimming deeper. Its aim is not unerring and I have often seen it miss its mark. If successful it usually flies away, carrying its booty in its bill and chattering loudly. On July 30, just southeast of the village of Vienna, I saw a kingfisher perch in a tall willow at the edge of a very shallow stream, so shallow in fact that it would hardly seem to offer any prospects for a kingfisher. The willow-lined banks of Chittenango Creek, the overhanging trees and the pilings and stakes in the waters of Oneida Lake, as well as the stumpy waters of Francis

Pond and other small outlying ponds are favorite feeding places of this bird. Frequently, too, it may be seen fishing from the small swimming-docks anchored about the shores of Oneida Lake.

That the kingfisher can adapt itself to some extent to conditions that may confront it is well illustrated by some individuals I saw fishing at Black Creek in the Cicero Swamp southwest of Clay. By mid-July the waters of this creek become so covered with duckweed in most places that movements of fish in their depths can scarcely be seen by the kingfishers. The birds then repair to the telegraph wires stretched above the creek where it flows under the railroad bridge. From this point of vantage they can look into the deep water under the bridge, which is practically free from duckweed because of the current existing in this narrow causeway.

Sometimes the kingfisher flies along a few feet above the water and suddenly darts down to seize a passing fish. Again it may be seen hovering twenty to thirty feet above a quiet pond,—a lagoon at the margin of Oneida Lake near the trolley station at Lower South Bay was a favorite place for this performance—its wings flapping rather laboriously, its head bent downward as it peers into the depths below. Then like a flash the bird plunges straight down—and usually rises with its prey. Not infrequently it recovers itself before the dive is well started, probably because its intended victim took alarm. Minnows, chubs, small suckers, perch and trout are the principal kinds of fish eaten by this bird. Usually small forms two or three inches long are taken, but I once frightened a kingfisher into dropping a brook trout six inches in length. Aquatic insects, small frogs and crayfish also form a part of its food. I am told that at the F. C. Soule estate near Cleveland the kingfisher takes a good many trout from the artificially stocked streams. Owing to its habit of alighting on high limbs and the tops of tree stubs it sometimes becomes a victim of steel traps set on the posts on this estate to catch marauding hawks. The fact that the kingfisher does not discriminate in its fishing but takes small game fishes with the rest has caused considerable popular outcry against it in the Oneida Lake region and elsewhere.

Not long after its arrival in spring the kingfisher mates, and the pair begins the excavation of a burrow in the steep, often perpendicular, banks of the lake shore or of a gravel or sand pit. I have found burrows in the high banks of Oneida Lake near Cleveland, and at Shackelton Point; in the banks of gravel pits just south of the West Monroe Cemetery and elsewhere in the region, and in the precipitous sandy banks of Fish Creek.

About a mile north of the village of Jewell and near Mud Pond I found on June 14, 1928, a kingfisher's burrow in an abandoned gravel pit. A heavy mixed woods surrounded the pit which occupied a cleared area near a moderately traveled highway. The wall of the pit was about seven feet high. The burrow was between four and six inches in diameter and two feet from the top of the bank. It penetrated the bank to a depth of four feet. Its terminus was somewhat enlarged, but there was no indication of a nest to accommodate the seven nestlings that inhabited it (Fig. 195). They were about two weeks old. The feather tracts showed plainly and the wing quills were well out. Excrement, fish bones

or other remains of previous meals were totally absent, the place was clean and not ill-smelling. The birds offered no resistance on being handled. During our examination of them the young were placed together in a little group in the open, and although the day was cloudy they sought the shadow of my body and huddled there while we examined and banded them. They exhibited the usual tendency to walk backward when I tried to grasp them. This habit is not peculiar to kingfishers, however, for I have noted it also in young bank swallows. The day was hot and sultry and they were soon breathing rapidly, with their bills wide open. In this way the moist mouth membranes are exposed and the cooling process assisted by evaporation.

Although we could not be absolutely sure of the age of these young kingfishers it was decided to institute a series of temperature readings on them at stated intervals. Accordingly they were banded (with the numbered tags furnished by the U. S. Biological Survey), and readings were made on alternate days, at approximately the same time of day, with a specially built clinical thermometer graduated in the Fahrenheit scale. At no time was the adult bird found in the burrow immediately preceding our arrival, so that the temperature of the young was not modified by any warmth received from the parent's body. All the temperatures were taken by the interthoracic method. Ordinarily the birds struggled very little during the manipulation. The following table shows the results of our findings from June 16 to June 29, inclusive.

TABLE NO. 25.—TEMPERATURE READINGS ON YOUNG BELTED KINGFISHERS.

Band No.	Sex	Date						
		June 16	June 18	June 21	June 23	June 25	June 27	June 29
220486	♀	101.1	102.8	101.2	103.6	105.1	103.6	105.9
220487	♀	102.6	102.4	103.5	103.7	104.9	104.4	106.4
220488	♂	101.9	103.9	103.6	104.2	105.5	102.0	106.9
220489	♂	101.9	104.0	103.9	104.4	104.7	105.0	105.8
220490	♂	102.4	102.8	103.6	104.4	104.6	105.3	108.0
220491	♂	102.2	103.7	102.8	103.6	104.1	106.4	escaped
220492	♀	102.2	103.1	103.6	104.1	104.6	105.3	107.1

While the results obtained are not absolutely uniform it will be observed that a fairly steady increase in the body temperature of the birds takes place as they grow older and that the temperature is fairly constant for all the individuals of approximately the same age. It will be noted that the reading for No. 220486 on June 21, is more than two degrees lower than for any of the others. This bird was the last in turn to have its temperature taken and so was in the burrow, more or less alone, from the time readings were begun on the others until its turn came. Probably some of its body heat was lost in this interval for it did not have the body contact with its fellows, and was in the cool nest that had been opened from above, thus permitting warmth to be dissipated. This illustrates very well the way in which the temperature of young

birds with slight feather covering and, as yet poorly developed temperature control mechanism, fluctuates with any change in the temperature of the surrounding medium. The temperature of adult birds is not so readily subject to these changes. In a general way the results of this experiment show that the temperature of these birds has increased from an average of about 101.5° F. to about 106.5° F. within a period of a little more than two weeks. Apparently the latter figure is about the average temperature for the species at the time of leaving the nest.

By June 23 the feathers on the young birds were well grown and the sex of each could be distinguished with certainty for the first time by the now rather pronounced brownish breast band of the females. The youngsters seemed very clean, active and alert but permitted themselves to be handled without exhibiting any fear or alarm. Both the nest and the burrow were kept scrupulously clean by the adults, and it was not until June 27 that the nest chamber showed any sign of dampness from the now slight accumulation of semi-liquid excrement; as a result, the place presented a strong odor of ammonia. Upon removing some of this moist earth I found a single beetle larva and a few fish scales mixed with it.

It is of interest to note that one of these young kingfishers, No. 220486, a female, was taken by R. Jackson at Barneveld, New York, on August 9, 1928, a little more than seven weeks after the bird was banded and approximately five weeks from the time that it left the nest. Barneveld is about twenty-five miles northeast of Sylvan Beach and thirty miles, air-line, from the place of original banding. The autumnal migration had not yet begun. Incidentally it may be mentioned that the rapidity with which young birds leave the locality in which they were reared is one of the points, among many others, upon which light will be thrown through bird banding activities. This means of investigation, sponsored by the Federal government, will ultimately produce important results. It has already proved of value in connection with conservation and protective measures.

On May 27, 1929, I visited this gravel pit for the first time that season and found that a new burrow had been excavated, a foot directly below the old and now unused one. Whether this new burrow was the work of a parent of the brood of the preceding season or by one of its progeny I do not know, for I was never able to capture this individual. The burrow paralleled exactly the one of 1928, but was two feet longer. It contained seven eggs, three of which were accidentally broken when I opened it. These eggs were about two-thirds incubated. A few fish and crayfish fragments lay in the cavity with the eggs. My next visit to the nest was on June 8, when I found and banded the four young which were then a week old (Fig. 194). In the chamber occupied by the birds was some excrement, and a number of beetles (*Histeridae*) were crawling about in the dung and earth upon which the young birds were squatting.

The kingfisher has its natural enemies in the Oneida Lake region as elsewhere, as evidenced by remains occasionally found. Thus in the woods a mile east of Verona Beach I found remnants left by some predator, probably a hawk.

I have also seen red-winged blackbirds pursue and harass kingfishers on many occasions.

Although the kingfisher does occasionally take some game or food fish fry or fingerlings, it compensates for this in taking more of the various minnows that are competitors for the food supply.

ORDER PICIFORMES

WOODPECKERS: FAMILY PICIDAE.

Northern Flicker. *Colaptes auratus luteus* Bangs.

Without doubt the northern flicker is the most abundant and generally distributed representative of the order in the Oneida Lake region. The fact that it has acquired more than 100 common and colloquial names throughout its range in this country bespeaks the general recognition of the species. Such terms as high-hole, high-holder, golden-winged woodpecker and yellow-hammer are most popular in my experience.

Even though some individuals may remain in this region throughout the winter, the northern flicker is essentially a migratory species whose arrival from the South may be expected late in March or early in April. The bulk of the birds disappear again during the latter half of October. Distinct migratory "waves" or collective movements during both spring and fall are often apparent, and while I have not witnessed them here during my periods of field work, they commonly occur before May 1 and after August 15.

During the summer months the flicker is a common inhabitant of old orchards, sparsely wooded groves, wooded lake shores and stream banks and woodlots near farmhouses. Heavily wooded areas do not attract it so much, but the margins are often favorite resorts, and it is of frequent occurrence on the lawns and in the trees of the towns and villages throughout the territory. The large old willow and maple trees in the Fish Creek Landing and Hitchcock Point districts offer tempting nesting sites, as do the moderately wooded sections along the north side of the lake. Our records indicate that the bird is commoner here and in the Fish Creek Landing district than in the flat, more sparsely wooded sections to the south. It frequently takes up quarters in old orchards or individual trees about farm buildings and along roadsides. Decayed tree stumps along the shores of Oneida Lake and outlying smaller ponds and lakes attract it. Both Frenchman and Dunham islands are favorite retreats of the flicker and it also breeds there. In fact this woodpecker is pretty generally distributed as a summer resident throughout the entire territory.

The northern flicker is more terrestrial than our other woodpeckers, and ants are a favorite food. Hence it often may be seen on lawns and elsewhere, busily feeding upon these troublesome insects. Its flight is of the undulatory type so characteristic of the woodpeckers. It perches on the limbs and twigs of trees and can cling to a vertical surface after the manner of its relatives. On a few occasions I have seen it resting on a limb much after the manner of a whip-poor-will or a nighthawk.

Gregarious tendencies are frequently exhibited by this species, and one occasionally comes upon small loose groups of individuals in meadows or about woodlands or orchards. My experience here has been that such groups are usually seen in more open situations.

While the flicker is not habitually belligerent, it does on occasion show some aggressiveness. This most frequently occurs during the breeding season. For example, on July 11, 1929, in the Parker woods south of Lakeport, I came upon several flickers and two or three crows that were tormenting a red-shouldered hawk. The flickers were pecking excitedly on the limbs of the tree on which the hawk perched, and clamoring loudly at it. When the hawk flew off the flickers darted after it, pecking it unmercifully until it lit again, when they were cautious about approaching close to the harassed hawk. This quarrel was continued for more than half an hour.

Flickers often light on highways to secure food, and in such situations are often killed by passing motor cars. Birds killed in this manner are frequently seen on the highways about the lake.

The courtship antics of the flicker are elaborate and interesting. Late in April and early in May the males often indulge in a variety of bobs and bows and struts, displaying themselves before the females and, at the same time, uttering the familiar "yucker, yucker" note. At this season too, the long rolling "wick-wick, wick-wick," which is undoubtedly a mating song, is to be heard. In spring and early summer particularly the flicker often indulges in drumming. More than once while preparing certain parts of this report at my quarters in Cleveland I have been startled by the rolling tattoo of the bird on the tin roof above. Often a dry limb or other resonant object is chosen for this performance.

The nesting cavity is usually excavated in a dead tree or stub; and sometimes a fence post, a stump or nesting box is chosen. Occasionally damage to buildings is done by the flicker in its attempt to excavate a nesting site in a cornice or other part. The nest may be from three or four to forty feet above the ground. A round opening about two and one-half inches in diameter permits access to the cavity proper which is enlarged at the bottom. It varies in depth from ten to twenty-four inches. There is no lining, and the five to eight white eggs are deposited on a bed of fine chips.

The usual complement of eggs is six or seven. The egg-laying ability of this bird has been demonstrated on numerous occasions by systematic removal of eggs as laid. I believe the record is held by a bird kept under observation by Mr. Charles L. Phillips of Taunton, Massachusetts, who on May 6, 1883, discovered in a large willow tree, a hole containing two eggs of this species. In his own words: "I took one, leaving the other as a nest-egg, and continued to do this day after day until she had laid *seventy-one* eggs.

"The bird rested two days, taking *seventy-three* days to lay seventy-one eggs . . ." (The Auk, Vol. 4, No. 4, 1887, p. 346.)

Both sexes take part in incubation. The young are hatched naked and their feather covering grows but slowly. During the time they are in the nest they are very noisy, particularly as they grow older, when they frequently climb up

to the entrance hole to be fed by the adults. Feeding is accomplished by the process of regurgitation.

A chronological arrangement of some of our records of the nesting activities of the flicker in the Oneida Lake region will be of interest here.

May 17, 1929. Birds working on an excavation for a nest in the dead stub of an old maple tree at the Vandercamp woods, near a large unoccupied barn.

June 8, 1929. Nesting cavity thirty feet up in a large dead chestnut stub, at roadside one and one-half miles northeast of Jewell.

June 9, 1928. Banded five nestlings; nest five feet up in hollow apple tree, twelve yards from State road, at an abandoned orchard in the Lower South Bay district.

June 23, 1928. Young in nest in a dead maple tree, forty feet up; hemlock-beech-maple forest north of Jewell. This nest was higher up than any other we found in the region.

July 3, 1929. Nest with well-developed young; adult feeding them at opening of nest, in a roadside maple tree, fifteen feet up, near the William Parker farmhouse, one and a half miles southwest of Lakeport; nest very ill-smelling.

July 5, 1929. Nest with young ready to leave in about a week; in dead stub of roadside maple, twenty feet up; one and a half miles southwest of Lakeport.

July 5, 1929. Nest with four very young naked birds; top of decayed maple at roadside, William Parker farmhouse southwest of Lakeport.

July 18, 1928. Young flickers out of nest; Muskrat Bay district.

July 26, 1928. Nest with four young in dead stub of a very large roadside maple, about thirty feet up; in Vandercamp woods northwest of Cleveland. Birds about ready to leave nest. Both the nest and the birds heavily infested with large reddish-brown mites; despite this multitude of parasites the young flickers appeared to be in a thriving condition.

August 1, 1929. Young about ready to leave nest; in old tree stub just north of Constantia. This is a late date for young still in the nest and indicates a second brood.

At the Herbert Walker farm near Fish Creek Landing, a flicker laid a clutch of eggs in the stub of an old maple tree, but these were, according to Mr. Walker, destroyed by starlings. He then got rid of the starlings by shooting many of them, whereupon another clutch of flicker eggs was laid and the young successfully reared.

Although in this region I have not seen the flicker nesting in boxes put up for it, it is said to accept such hospitality freely. However, the number of available natural nesting places here is so great that I doubt whether nesting boxes would offer much appeal. On the other hand boxes of a certain rustic type with roughened interior and bottom covered with chips or sawdust, set up in natural surroundings, might prove effective.

Stomach examinations made by the U. S. Biological Survey show that about fifty per cent of the food of the flicker consists of ants. From the crop and stomach of a single bird over 5,000 of these insects were taken, and the stomachs of two others each contained more than 3,000. (Beal, 1911, p. 54.) The re-

maining ten per cent of animal matter taken by the flicker consists of a variety of insects, including injurious beetles, grasshoppers, bugs and caterpillars.

Approximately forty per cent of the flicker's diet is derived from the vegetable kingdom, of which the fruit and seeds of wild plants such as poison ivy, sumac, wild cherry, elderberry and the like constitute the major part. In late summer, in the Oneida Lake region, the flicker is one of the birds that visits in numbers the blueberry, huckleberry and pin cherry thickets in the Cleveland, Constantia and other districts. Mast, seeds and corn and other cultivated grain make up small proportions of the bird's yearly diet; and occasionally the bird takes cultivated fruit, particularly cherries.

On the whole the economic status of the flicker is commendable. The most serious charge against it is its destruction of a few predacious beetles, its broad-casting of seeds of undesirable plants and its inclination to feed upon useful farm and orchard products. The comparatively slight damage thus entailed is far more than paid for by the destruction of insects harmful to agriculture, horticulture and forestry.

Upper parts brown, barred with black; rump white; scarlet occipital crescent; under parts grayish white or buffy spotted with black; black crescent on breast. Male with a broad black stripe on each side of throat from base of bill; these marks lacking in the female. The undulatory type of flight, conspicuous white rump and golden-yellow wing-linings and under surface of tail are good recognition marks.

Northern Pileated Woodpecker. *Ceophloeus pileatus abieticola* Bangs.

While I never actually saw this bird in the field in the Oneida Lake region we did come across what I believe to be unmistakable evidence of its recent presence in heavy woodland at several points in the vicinity of the lake.

About four miles northwest of Cleveland, on the highway known locally as the "Panther Lake Road," is a considerable tract of mature mixed forest—beech, maple, hemlock and birch. This dense woodland lies on high, rolling ground and in it are some of the largest and finest beech trees that I have seen anywhere. Very little undergrowth occurs except in low boggy places.

While walking through this woods on July 30, 1928, I discovered in a large dead beech stub, about forty feet in height and two feet in diameter at the base, two very large drillings. These irregular mortise-like holes were from three to five inches deep, and perhaps twenty feet from the ground. Around the base of the stub lay a great number of chips and slivers from one to three inches in length. The work gave every appearance of having been done but a short time before my visit.

The next day I returned to this place and discovered still further recent work of this woodpecker. In the side of a dying hemlock, about eight inches in diameter, were several large, irregular excavations, some of them as much as three to four inches deep (Fig. 197).

Although I sought for this splendid woodpecker I was unable to find it. Upon my return to this same woodland in late May, 1929, I found no fresh drillings. However, on June 6, about a quarter of a mile north of the same



Fig. 196. Workings of northern pileated woodpecker in Adirondack forest.
(Photograph by C. E. Johnson).



Fig. 197. Diagram illustrating type of work of northern pileated woodpecker observed on hemlock tree in Constantia Center district.
July 31, 1928.



Fig. 198. Eastern robin at martin house. Lower South Bay district. The robin successfully reared a brood in this house. May 23, 1928.



Fig. 199. Removing nests of English sparrows from martin house. Note the method of hanging the supporting pole to a bolt. Another long bolt through the pole holds it in an upright position. May 27, 1928.



Fig. 200. House erected for purple martins. Lower South Bay. May 27, 1928.

spot Mrs. Stoner found fresh excavations in a dying beech about twenty-five yards from the main highway. The interior of this tree apparently had been heavily infested with wood-boring larvae and in attempting to secure them the woodpecker had chiseled out great, irregular holes some as much as a foot in height and six to eight inches in depth. Because of the usually shy disposition of the pileated woodpecker I was a little surprised to find evidence of its activities so close to a frequently traveled highway.

Again on July 8, 1929, in the heavy mixed hardwoods of a high ridge through the extensive swamp west of Short Point, I came upon old workings of the pileated woodpecker about six feet from the ground, in a small live ash tree. Several large, irregular holes about two inches deep gave evidence of the presence of the pileated here possibly a year or more ago.

In conversation with Mrs. Howard Wright who occupies a cottage a mile from the place mentioned above, I learned that she saw "a large, black woodpecker with a scarlet crest" near her cottage in May, 1925.

Several times when I have been in deep woods on the north side of the lake I have thought that I saw the large black form of this bird flying through the shaded forest but I could never be sure of it. I am satisfied on the evidence cited that the northern pileated woodpecker belongs on the list of the local fauna.

This, the largest species of woodpecker in northern North America was formerly generally distributed throughout New York State, but it is now commonly found only in the coniferous forests of the Adirondacks and Catskills. Even in these districts it is said to occur only occasionally in dry open woods but more frequently in heavy forest areas. (Silloway, 1923, p. 472.) With the destruction of the larger evergreen forests and the constant persecution of this woodpecker by hunters, its numbers have been greatly diminished and it is doubtful whether it ever again can attain its former numbers, except perhaps in certain limited areas. While non-migratory in its habits it would not be too much to expect now and then a wanderer from the Western Adirondack districts into the well-wooded sections on the north side of Oneida Lake.

Largest of our woodpeckers. General coloration blackish; throat, two stripes on either side of head, one on neck, and wing-bar, white; top of head with scarlet crest.

Red-headed Woodpecker. *Melanerpes erythrocephalus* (Linnaeus).

This most striking and distinctive member of the group is a bird of the open woodlands and of cultivated and semicultivated districts of the region. It is not a common bird, but sometimes may be seen perched on a roadside telephone pole, fence post, or in a tree in the pasture lots near the lake; it is not to be looked for in the wooded sections.

The red-headed woodpecker was formerly more common throughout New York State than it is to-day, possibly because of more favorable habitat conditions at that time. However, it seems to have adapted itself so well and so quickly to artificial conditions—and other species of the group have successfully maintained themselves in the reduced acreage of woodland—that I am inclined to

attribute the decrease in its numbers to other factors. Not the least of these may be the considerable number killed on the highways by speeding motor cars.

While this woodpecker is essentially a summer resident in the Oneida Lake region and wherever else it may occur in the State, it occasionally remains over winter, particularly if mast is plentiful and the season not too severe. Ordinarily spring arrivals may be expected early in May. Although my earliest date for the species in the Oneida Lake region is May 16, I suspect that the birds had been here some days earlier. Ordinarily the autumnal retreat to the Southern states occurs in October.

That it is not a common bird in the territory under consideration is indicated by the fact that during the month of May, 1928, when we were in the field daily and traveled about 550 miles by motor car to visit various types of habitats about the lake, only three red-headed woodpeckers were seen. However, this does not present a fair view of the red-head's status here, for during the same period in 1929, several were seen, but all were in the vicinity of Cleveland and Bernhard Bay. I am inclined to believe that the numbers of this bird vary considerably from season to season, for it was notably commoner and more generally distributed in the summer of 1929 than it had been during the preceding season. It was not until August 3, 1928, that we saw as many as three in an entire day's trip.

From our observations the fact seems well established that the red-headed woodpecker is somewhat commoner locally on the north side of Oneida Lake than on the south side, for during the summer of 1928, we did not see the bird in the south side districts more than three times. In 1929 the situation was somewhat similar, though the species was more often seen throughout the region as a whole.

This woodpecker is much less common in the Oneida Lake region than either the flicker or the downy woodpecker. But in my experience it is somewhat more common here than the hairy woodpecker, so that on this basis it receives third place among the woodpeckers in point of local abundance although, as just noted, a considerable gap in numbers exists between the downy and the red-head.

During the course of our field investigations we have observed the red-headed woodpecker in most of the territory surrounding Oneida Lake, but in only a few situations could we be sure of finding the bird regularly. One such locality was a high meadow sloping gradually from the lake shore to the State highway, one-fourth mile away, at Hickory Point, on the north shore of the lake between Constantia and Bernhard Bay. On this grassy flat or meadow, which supports a sparse growth of shag-bark hickories (*Carya ovata* [Mill.] K. Kock) and which, in passing, it may be interesting to note is one of the few remaining growths of this kind in the territory, two or three red-heads invariably held forth. One nesting cavity was discovered in the territory, and from the number of young birds observed here a little later I believe that this is the most important nesting center in the immediate district if not in the entire region. Other localities apparently more or less favored by this woodpecker are the tall hardwoods on the lake shore near Shackelton Point, the vicinity of Cleveland, the more open terri-

tory east of Sylvan and Verona beaches, and the low-lying sparsely wooded districts south of Lakeport.

The flight of the red-headed woodpecker is not so constantly undulatory as that of our other woodpeckers. However, its progress through the air is of a powerful flapping type. While its feet are zygodactylous and, like those of our other representatives of the group, fitted for clinging, I have occasionally seen it perch crosswise on a small limb, grasping it after the manner of one of the passerine species. My observation has been that this mode of perching is more frequent among the woodpeckers than we have been led to believe.

The red-head is a raucous, noisy bird, particularly during the breeding season when the sexes with loud cries often pursue one another on the wing. The bird, too, has a habit of drumming on trees, poles, cornices and tin roofs sometimes to the exasperation of morning sleepers. Its call note is a loud "*tschur-tschur*," lower in pitch and of more rattling nature than in our other woodpeckers. When pursuing one another a hoarse "*charr-charr*" is given, and often repeated several times. Another note frequently heard is the oft-repeated, guttural "*ker-r-ruck*."

The red-headed woodpecker excavates a nesting cavity in the dead limb of a tree, in a decayed stub or in a roadside telephone pole, usually at a height of fifteen to thirty-five feet from the ground. A round opening two inches in diameter leads to the nesting cavity proper which is usually about a foot in depth. From four to six white eggs are deposited on a bed of clean fresh cuttings at the bottom of the cavity. Excavation of the nest usually is accomplished in late May or in June.

On May 17, 1929, near Bernhard Bay, a pair of red-heads was discovered drilling a hole in a roadside telephone pole, about twenty feet up, and doubtless nested there.

Young of the year were not infrequently seen after mid-July in the Bernhard Bay, Hickory Point and North Bay districts—all likely breeding places. The grayish head of the immature birds is confusing to some observers, but the white in the wings serves to identify them. Even in late July the replacement of gray by crimson can be detected, the spots and streaks of the brilliant color having already begun to show on the head and neck of the juvenals, which still associate more or less with the adults.

In an economic way the red-headed woodpecker has acquired a bad reputation in some places because of its destructiveness to small fruits and grain and to the eggs and young of other birds, including domestic poultry. Cognizance must be taken of such marauding propensities in determining its status in a community, but in the Oneida Lake territory its numbers are so reduced that no mischievous habits are evident.

The red-head captures many insects on the wing, making its sorties from some perch, somewhat after the manner of a kingbird or other flycatcher. It also seems to have developed the habit of resting on roadside fence posts, telephone poles and other nearby points of vantage to look for waste grain or for insects crawling on the paved highways. This habit, I believe, is largely responsible for the high mortality among these birds from speeding motor cars.

In a communication to Science (Vol. 61, No. 1568, 1925, pp. 56-57) the present writer offered some discussion on this point in connection with certain observations made on an automobile trip on July 15, 1924, from the Iowa Lakeside Laboratory to Marshalltown, Iowa, a distance of 211 miles, all on well graveled roads. En route, 105 dead animals representing fifteen species were counted; of these, thirty-nine were red-headed woodpeckers. The mortality in this species was higher than for any other species of vertebrate animal noted and I believe that several contributory factors are responsible for it. First, these birds have a propensity for feeding upon insects and waste grain in and along the roads; second, they delay taking wing before the approaching car, in all probability being poor judges of its speed; and third, they have a slow "get-away," that is, they can not quickly gain sufficient speed to escape the oncoming car. However, I feel certain that a speed as high as thirty-five to forty miles an hour is necessary in order to overtake these birds.

Since the above mentioned article was written I have traveled many thousands of miles over the Central, Southern, South Atlantic and Eastern States and I have found no reason in any way to modify the above statement as to the three factors concerned. Indeed all the later evidence substantiates the view.

Somewhat less than thirty-five per cent of the diet of the red-headed woodpecker consists of animal matter, and about one-half of this of beetles of which an appreciable proportion is beneficial. Other insect food consists largely of ants, grasshoppers, crickets and bugs. Vegetable material makes up more than sixty-five per cent of the diet, and of this, wild fruits, seeds and mast constitute roughly forty per cent, and cultivated fruits, corn and grain about eight per cent.

We have here on a few occasions noted the red-headed woodpecker's well known habit of placing acorns, grain, etc., in crevices and crannies of posts, trees and the like for future use. I am not at all certain that it later visits and draws upon this source of supply to any extent.

While this bird undoubtedly does some damage, on the whole its beneficial qualities seem to outweigh its bad ones, so that it should not be killed indiscriminately.

This is our only black and white bird with red head and neck. Immature birds are grayish brown, spotted or streaked with fuscous where the adults have red and black. During the first winter the grayish of the head is replaced by crimson and that of the back, wings and tail by black.

Yellow-bellied Sapsucker. *Sphyrapicus varius varius* (Linnaeus).

That the yellow-bellied sapsucker is not a common bird in the Oneida Lake region is indicated by the comparatively few occasions, eight in all, when we have come upon the species here in our two seasons of field work. Our earliest spring record is May 24 and our latest July 30. I have never seen more than a single individual of this species on any day, so that on this basis alone it must be considered a rather uncommon transient in this territory. Sadler (1926, p. 10) gives the earliest spring date for this bird in the Syracuse district as March 29.

The following are the localities in which I saw the sapsucker: Sylvan Beach, Phillips Point district, Vandercamp woods, Cleveland district, Louis Will Game

Retreat and Breeding Ground, and Panther Lake district. It was at the latter place that I found the bird on July 30. Here also, I found its drillings on white oak, birch and other trees. Although I did not see the species at Vandercamp woods on May 17, I found extensive fresh workings on a hemlock. The frequency of its workings leads me to think that the bird is commoner than my sight records indicate. By May 1, the earliest spring date officially covered in this report, I suspect the bulk of the northward movement is over and the birds seen in the Oneida Lake region after that date are probably either stragglers or possibly a few nesting individuals. The fact that I have seen both males and females here as late as June 5, lends some support to the latter view.

In most parts of New York State the sapsucker is a common migrant from April 1 to May 20. There is some evidence to indicate that the males migrate in advance of the females. The autumnal movement reaches its peak about mid-October. In the warmer parts of the State over-wintering birds are not uncommon. In New York, too, the breeding range is confined largely to the Adirondacks and the Catskills, where it is the most common representative of the group in the summer season. Nesting records are available also for central, western and southwestern New York, and Eaton (1910) reports it as breeding in Oneida and Oswego counties. Although only circumstantial, my evidence on its nesting is from the Panther Lake district in Oswego County.

During migration the yellow-bellied sapsucker is quiet and retiring; probably on this account it is frequently overlooked in the field. It often clings to the side of a tree, busily pecking away without any drumming. Drumming is reserved for the breeding season a little later. In the spring, too, the birds are shy. If one approaches the tree from the side upon which a sapsucker is working, the bird will usually shift quietly to the opposite side. At this season the sapsuckers frequently utter a harsh squealing note as they protest the presence of some other bird about their borings.

Not only during migration but also on the breeding range do these birds carry on their borings through the bark of trees, to feed on the exuding sap. Frequently a considerable area of these punctures will so drain a tree and lower its vitality that it will die. In the Oneida Lake region I have noted extensive borings on hemlocks, birches, hickories, maples, beeches, oaks, elms and white and pitch pines. Sometimes the trees are almost girdled by the linear horizontal and vertical rows of perforations. In addition to the sap issuing from these holes the sapsucker feeds also on insects attracted to it and on the soft cambium layer which lies just beneath the bark. Considerable damage is done by the bird to the tree in getting at this softer portion.

"As the most abundant woodpecker in the Adirondacks it [yellow-bellied sapsucker] deserves careful study and a fair trial before condemnation. It habitually injures or kills a large number of trees, including some of slight and others of much economic value. The destruction of some young aspens and birches only amounts to a slight thinning, and may be beneficial to more valuable young trees growing under them, but the killing and injury to older trees is generally harmful. The large diet of wild fruit makes it capable of materially aiding the reforestation of wild burned lands, and in making conditions on such lands

more favorable for deer,—as in the case of other fruit-eating birds. It thus also aids in the conservation of soil and water. That it eats relatively few of the fruits of poisonous plants is also favorable." (Adams, 1923, p. 516.)

In addition to weakening and disfiguring trees, shrubs and vines and killing some of them outright, the yellow-bellied sapsucker does further damage in causing defects in trees used for commercial purposes. More than 250 kinds of trees, shrubs and vines in the United States are known to be attacked by this bird, and of the 174 species of trees attacked, the wood in twenty-two of the species is often made unfit for anything except rough construction or fuel (McAtee, 1926, p. 39). The borings of the bird permit moisture to enter the wood, causing stains, disfigurements and growths and facilitating attacks by fungus, so that a considerable loss entails when the wood is to be used commercially in the form of lumber.

The white of the wing coverts is exhibited as a distinct longitudinal stripe on the wing when the bird is at rest and this feature will serve to distinguish the yellow-bellied sapsucker from any of our other woodpeckers. In the male the throat is scarlet while in the female it is white; both male and female have the scarlet crown.

Eastern Hairy Woodpecker. *Dryobates villosus villosus* (Linnaeus).

This large woodpecker is a permanent resident in the Oneida Lake region and while it is somewhat less common than its congener, the downy woodpecker, it is probably seen as often as that species because of its larger size and more impressive vocal efforts. The hairy woodpecker frequents woodlands more habitually than does the downy, particularly during the summer, and our observations indicate that it chooses the heavier and more secluded woods in which to nest rather than the vicinity of human habitations so frequently selected by the downy.

Although at all times it is shier and more suspicious than the downy, during May and June, when breeding and nesting activities are in progress, the hairy woodpecker is not so much in evidence as it is later in the season. By way of illustrating this point it is worthy of note that on an all-day field trip taken in the Cleveland, Gordon Pond, Jewell and Vienna districts on June 18, 1928, and in the course of which thirty-one miles were traversed by automobile and many heavily wooded areas were visited, a list of sixty-five species of birds was obtained. Comparatively few woodpeckers were observed in these wooded districts where we should expect to find them in greater numbers. Neither a downy nor a red-headed woodpecker was included in the day's list, and only one hairy woodpecker was seen. On the other hand several flickers were noted. Later in the season, both downy and hairy woodpeckers are generally more in evidence in these wooded sections.

A field note under date of July 18, 1928, made after a visit to the Muskrat Bay district states that, "While this species (hairy woodpecker) and the downy woodpecker are probably not more common than they were a few weeks ago, they are to be seen oftener now." This greater apparent abundance and more uniform distribution as the season advanced was also evident during the summer



Fig. 201. Bird houses on lawn of summer home at Lower South Bay. May 2, 1928.



Fig. 202. Purple martins on telephone wires, Lower South Bay. August 15, 1928.



Fig. 203. Chittenango Creek near its mouth. Nesting habitat of eastern kingbird, northern crested flycatcher, bronzed grackle and tree swallow. The stump on the bank at the right of the scene hides an incubating tree swallow. May 28, 1928.

of 1929 when both the downy and hairy woodpeckers seemed more abundant than they had been in 1928.

In general, while the hairy woodpecker was found sparingly in all the wooded sections of the territory, it was most common in larger hardwoods lying to the north of Oneida Lake and those in the Sylvan Beach and Big Bay swamp districts.

This woodpecker exhibits the strong, characteristic, undulating flight of the group, usually not continued over great distances but from one forest tree to another, where it hacks away industriously in excavating wood-boring larvae, the while hitching itself up or down or sidewise on the tree with tail closely appressed to the bark.

The call of the hairy woodpecker is similar to but louder than that of the downy; it has been written "*huip, huip.*" (Eaton, 1914, p. 141.) It also has a rattling call "*trrii, trrii,*" and often utters a series of notes, "*wick-a-wick-a-wick,*" similar to those of the flicker. The drumming, so characteristic of all our woodpeckers, is loud and with a considerable interval between the strokes.

The hairy woodpecker usually chooses a nesting site well up in a dead or dying maple, beech or other forest tree. Isolated and little frequented woodlands seem to be preferred. A circular entrance two inches in diameter is drilled into the tree for two or three inches, when the downward excavation is begun and continued for eight to twelve or sixteen inches. Both sexes take part in nest building, which may begin in the latter part of April and continue well through May. The white eggs, usually three or four, are deposited on a bed of chips at the bottom of the nest cavity.

On the west side of Baker Point, near Constantia, where a maple-elm flat verges upon the lake shore, a nest containing half-grown young was discovered on May 21, 1929. This nest was about fifteen feet up in an old maple stub which stood fifty yards from the water's edge. On June 6, 1929, in heavy beech-maple-hemlock woods four miles northwest of Cleveland, another nest was found that was in a hollow limb stub of a beech about forty feet from the ground. The tree itself was living. This nest contained young large enough to climb to the entrance to be fed.

Although this bird is sometimes called "sapsucker" or "big sapsucker" it has none of the injurious habits of its relative, the yellow-bellied sapsucker. On the contrary, the hairy woodpecker exhibits a liking for wood-boring larvae of various kinds and destroys quantities of these. Studies conducted by the Division of Food Habits Research, U. S. Biological Survey, show that from twenty-one per cent to forty-one per cent of the hairy woodpecker's food in every month of the year is made up of those forms which are so destructive to forests and forest products. Other beetles, mostly injurious, make up about ten per cent of its food. The other items of its food are also important, namely, caterpillars—practically all of injurious kind so far as man is concerned—which form ten per cent of its yearly diet, and ants which form seventeen per cent of its food. More than seventy-seven per cent of the yearly diet of this woodpecker consists of animal matter, and about twenty-three per cent of vegetable matter consisting

mostly of wild fruits, seeds and mast. The food habits of such a bird leave little room for doubt concerning its desirable and beneficial qualities.

Upper parts black more or less spotted with white; middle tail-feathers black, the outer ones white; a white stripe above and one below the eye; under parts white. Sexes alike except that the male has a scarlet occipital patch which is lacking in the female.

Northern Downy Woodpecker. *Dryobates pubescens medianus* (Swainson).

At once the commonest, the smallest and the most confiding representative of the group in this region, the downy woodpecker is an economic asset out of proportion to its size. It is a permanent resident. While it is found more commonly in the wooded sections of the region, its occurrence is often noted in the more open cultivated districts, particularly during the nesting season when it frequents orchards, farmyards and even the towns and villages about the lake. Among the woodpeckers, it is exceeded in numbers in the Oneida Lake region only by the northern flicker.

Mixed woods and hardwoods, especially those bordering streams or lakes, appeal most to the downy woodpecker. While we have found it all about the lake, it appears to be less common in the heavily wooded areas north of the lake than elsewhere in this particular territory. Localities of its greatest abundance include the woodlands in the Sylvan Beach district, the old willow growths in the Short Point district, the North Bay district and such isolated wooded tracts as the Emmons, Van Antwerp and Sauers woods. On July 24, 1928, I found it on Frenchman Island and I suspect that it nests there.

The woodpeckers here listed are all zygodactylous, that is, they have two toes of each foot directed forward, and two backward. And their tail feathers are stiffened. These are adaptations for climbing, clinging or resting on vertical surfaces, such as tree trunks.

Although the downy usually rests and feeds while clinging to a vertical surface I have frequently seen it perch *crosswise* of a small twig or limb, after the manner of a true perching bird; and once I saw a downy woodpecker on one of the high tension wires crossing the Cicero Swamp south of Clay. This method of perching is probably frequently adopted also by other woodpeckers.

The usual call of the downy woodpecker is a sharp metallic "*peek*," similar to but not so loud as that of the hairy woodpecker. Sometimes this note is repeated rapidly in a long, rather high-pitched series, the pitch gradually diminishing toward the end of the succession of notes.

The nesting hole of the downy woodpecker is frequently excavated in the stub of a dead tree or limb in sparse woods, orchards, or in shade trees about farmhouses or villages. Entrance to the gourd-shaped nest-cavity which may be from six to ten inches deep, is effected through a round or oval hole about one and a half inches in diameter, which may be anywhere from eight or ten feet to forty or fifty feet from the ground. In this region excavation of nesting holes may begin late in April but I believe most of the work is done during May. The four to six eggs are pure white.

A farmer near Fish Creek Landing told me that a family of young downy woodpeckers had been reared in a tree on his lawn and that they had left the nest between June 17 and 23.

On July 3, 1929, about two miles southwest of Lakeport, in a low-lying hardwoods consisting largely of maple, elm and basswood, I found a nest with two young about ready to leave. This nest was in the top of a dead basswood stub thirty feet high. I succeeded in banding one of the birds but the other was able to fly well enough to escape me.

The manner and place of feeding of this little woodpecker are similar to those of its larger cousin but it works less in decaying wood and hence secures fewer wood-boring larvae. It is also inclined to stay more about orchards and cultivated trees. But the greater numbers of this little woodpecker make up for its lesser individual stomach capacity, and its usefulness in holding in check destructive forest, orchard and shade tree insects is well recognized.

Stomach examinations made by the U. S. Biological Survey reveal that more than seventy-five per cent of the food of the downy woodpecker consists of animal matter, of which ants form about twenty-two per cent, caterpillars—mostly wood-borers—about seventeen per cent, and the wood-boring larvae of beetles about fifteen per cent. Most of the remaining animal food consists of other destructive insects and of spiders and millipeds. About twenty-four per cent of the bird's food consists of vegetable material, of which wild fruits and seeds constitute the bulk. A little cultivated grain, mostly waste corn, and a small amount of the cambium of trees, also is taken.

Similar to the hairy woodpecker but to be distinguished from it by its smaller size, shorter bill, and black-barred outer tail-feathers.

§

ORDER PASSERIFORMES

TYRANT FLYCATCHERS: FAMILY TYRANNIDAE

Eastern Kingbird. *Tyrannus tyrannus* (Linnaeus).

This active, belligerent and harsh-voiced flycatcher is one of the dominant summer birds in the cultivated and semi-cultivated areas south of Oneida Lake, as well as along the low willow-clad shores and roadsides near Constantia and other points on the north side of Oneida Lake. Its arrival from its winter home—which extends from southern Mexico to British Guiana—may be expected during the first week of May. My earliest records are May 5, 1928, and May 4, 1929. Arrivals in late April have been reported from more distant localities. Most of the birds have departed for the South by September 20.

The kingbird is seen frequently in low willow and alder flats along the lake in and about old orchards, where it frequently nests, along roadsides supporting low bushes and trees, and in low meadows bearing sparse and intermittent growths of scrub willows or other shrubs or small trees. Dense woodland seems to offer no attraction for it. Localities in which the bird was found to be particularly common include the district near the mouth of Chittenango Creek, the Short Point district, Fish Creek Landing district, Coble Point district, Lower South Bay district, Cicero Swamp southwest of Clay and roadsides and open fields east

of Cleveland. While this flycatcher seems to be commoner in the open places on the north side of the lake, it was, in general, more plentiful throughout the entire region in the season of 1929 than in that of 1928. Such local fluctuation of numbers of this or other species is, of course, no unusual occurrence among birds.

In common with most of our other representatives of the family the kingbird is often seen occupying some point of vantage from which it can scan the immediate territory for passing insects or some potential enemy. It takes the insects on the wing. Its belligerent character finds expression in the pursuit of every passing crow, hawk, bittern, green heron, red-winged blackbird or, failing any other, even one of its own kind. Several times I have observed the kingbird harass a bittern or a crow to such an extent that these larger but less active birds were forced to take to the tall rushes or dense woods to escape the attacks of their tormentor. On July 11, 1928, in the Cicero Swamp I saw a kingbird attack and put to rout a passing tree swallow; but a moment later a barn swallow accepted the challenge to his tribe by driving the kingbird from that territory. Such war-like sorties make up no small part of the activities of the kingbird which with its boldness and maneuvering ability usually gives a good account of itself.

As the breeding season approaches kingbirds are usually found in pairs about orchards and roadside trees offering suitable nesting sites. On June 18 I witnessed what appeared to be a mating display when at the Cicero Swamp a bird darted out from the limb of an isolated willow tree standing in the expansive cat-tail marsh, flew straight into the air for a distance of thirty to fifty feet, then returned to the perch in a broad circle. This performance was repeated several times within the space of a few minutes and was unaccompanied by any vocalization that I could hear.

My earliest nesting record for the kingbird is June 11, 1929, when a completed nest was discovered in a tall elm tree standing in water near Fish Creek Landing. On June 22, a nest containing three eggs was found on the trunk of a large willow that had fallen into Chittenango Creek when a portion of the bank caved in. The nest was about four feet above the water. On June 29 it was occupied by three white downy young. On this date, a little farther up the creek, another nest containing two eggs and a young bird, just hatched, was discovered in a similar situation. A third nest containing three young a week old was found on July 5, 1929, in an old apple orchard, about two miles southeast of Lakeport. This nest was about fifteen feet from the ground. Other nests containing young were found in orchards in the Shackelton Point and Delmarter Bay districts, in mid-July. One nest had been built about thirty feet up in a cottonwood tree near an abandoned farmhouse a mile south of Bridgeport.

It appears then that old orchards, taller trees about farm buildings, and low willows near water offer the preferred type of nesting situations to the kingbird, and that the height of its breeding season extends well through the month of June. The compactly built nest is usually composed of straw, weed stalks, grass and sometimes moss, with a lining of fine rootlets and grasses, soft bark or hair or wool, and is placed from six to thirty feet above the ground. The usual comple-

ment of eggs is three to five; three seems to be the average in the nests that I have found here. The eggs are creamy white in color and spotted with reddish brown, the spots arranged in a more or less distinct circle about the larger end.

In July, after the young have left the nests, it is not an uncommon thing to see family groups of kingbirds resting in various situations along the roadside. Although the birds of the year are at this time well able to fly they are often attended by the solicitous, chattering parents. It is at this season, too, naturally, that the species seems most irritable and pugnacious.

The kingbird has no song, and its high-pitched, harsh note can be mistaken for no other. "Its commonest notes sound like '*keep-keep-kip kipa kipa kipa kip*' emitted rapidly." (Saunders, 1923, p. 259.)

While the kingbird, bee-bird or bee martin as it is sometimes called, is under some suspicion on the part of agriculturists generally, stomach examinations of the bird show that this is scarcely warranted. That it does feed on some small fruit and that it does take some beneficial insects, among which are honey-bees—though these are mostly drones—can not be denied. But since almost ninety per cent of its food consists of insects which are in the main injurious, and since its presence about farm buildings is desirable in that it drives away marauding hawks and crows, the kingbird may well be encouraged.

The slaty general coloration, blackish head, black tail tipped with white and the white under parts are sufficient field characters. Unfortunately the concealed orange-red crown patch, common to both sexes, is seldom seen under field conditions. In the field, too, males and females are indistinguishable. The low, quivering, soaring flight together with the characteristic notes also are helpful aids to identification.

Northern Crested Flycatcher.

Myiarchus crinitus boreus Bangs.

This vigorous, loud-voiced representative of the family is a common summer resident in the Oneida Lake region and occurs in practically all of the sizable wooded sections. My earliest spring date for it is May 5, when I saw a single bird in the lower South Bay district. It is probable that the bird arrives from its winter home, which is southern Florida and Central America, a few days earlier. It nests in all parts of the State except the interior of the Catskills and of the Adirondacks. The autumnal movement continues throughout September. So far as the relative local abundance of the seven species of flycatchers found in the Oneida Lake region is concerned, I should say that the crested flycatcher is exceeded in numbers by the kingbird, phœbe, wood pewee, and possibly also by the least flycatcher.

The isolated wooded tracts so common on the south side of the lake seem to appeal particularly to this bird. Scarcely one of them lacks its nesting pair of crested flycatchers. Some of the woodlots in which I have consistently found it are the Van Antwerp woods, Emmons' woods, Sauers' woods, Dunham Island, woods south of Clay village and those at Lewis, Phillips, Hitchcock and Shackleton points. In addition, this flycatcher often frequents low-lying wooded areas in the vicinity of streams; the willow-lined banks of Chittenango Creek in the Hitchcock Point district and of Fish Creek near the village of Fish Creek Landing

afford examples of this type of habitat; the old willow stubs here offer suitable nesting sites. Again I have frequently found it in the more heavily forested sections such as the Panther Lake district and other wooded areas north of Cleveland, Constantia and Jewell, particularly in the mixed Vandercamp and adjoining woods, the Big Bay woods, Short Point district, and the Parker woods southwest of Lakeport. In early July I have observed this bird in the Cicero Swamp; it probably nests there. A complete enumeration of localities in which we have seen it in the region would include almost every field station visited by us. Contrary to the situation among our other flycatchers we have found this species to be as common, although not so noisy, in early August as through the three preceding months.

Often, on approaching a wooded area, the loud, raucous "*whe-ep*," sometimes followed by a coarse rolling "*raa, raa, raa*," advertises the fact that a pair of crested flycatchers is already in possession. In the nesting season one of the pair usually maintains a sharp lookout from a high perch in some tree at the edge of the woodlot, where it sights the intruder before he is aware of its presence. The bird is shy and in my experience here it does not wander far from its woodland cover. In this respect it resembles the wood pewee and differs from the kingbird.

The nest of the crested flycatcher is usually placed in a hollow tree or limb or in an abandoned woodpecker's hole, eight to fifty—generally less than twenty-five—feet from the ground. It is composed of grasses, rootlets, hair and feathers; and often but by no means always a piece of cast snake skin is woven into the structure. The exact function, if any, of this article is not known, but some have thought that its presence may serve to frighten away marauding squirrels or birds. Ordinarily four eggs are laid early in June.

On June 22, 1929, I found a nest in an old willow stub overhanging the waters of Chittenango Creek near its mouth. This nest was ten feet above the water, constructed of dry grass and lined with a few feathers; but a snake skin was not part of the nest material. It was in the decayed, hollow end of a limb about six inches in diameter. In the nest were two eggs, and three young between three and four days old. A week later I visited the nest again and banded the four young I then found in the nest. During the banding operation the adults returned to the vicinity and in response to the cries of the young uttered a series of most distressing and piteous moans, something like those of the catbird when its young or eggs are disturbed.

On June 29, I discovered another nest on the opposite bank of Chittenango Creek a mile from its mouth and three-fourths of a mile from the nest found the week before. This nest also was in a willow overhanging the creek and was about six feet above the water. It was built in the hollow stub of a limb which had broken off and was constructed of dry grass with a lining of feathers. As with the nest found earlier, a cast snake skin was here also lacking. It may be remarked that while the number of snakes in the Oneida Lake region, with the exception of water snakes (*Tropidonotus fasciatus sipedon*), is not large, if the bird were not too particular as to the *kind* of snake skin, it would have no difficulty in finding sufficient for its needs. This nest contained young birds

about eight days old; they were banded as numbers 251279-251283, inclusive. The crested flycatcher apparently prefers to nest in the vicinity of water, but I have found it during that season a half-mile or more from the nearest expanse of water of any size.

The crested flycatcher feeds almost entirely upon insects and spiders; very little vegetable food is taken and that consists of wild fruits. According to McAtee (1926, pp. 45-46), caterpillars and moths (Lepidoptera) come first in the list, and members of the orders Hymenoptera, Orthoptera, Hemiptera and Coleoptera make up the bulk of the remainder. With the exception of some of the four-winged insects (Hymenoptera) taken, the other items of its food are, in the main, harmful to man's interests.

This beneficial bird is one that can be encouraged to nest about farm buildings, cottages, camps and homes in the vicinity of woodland, for it will accept the hospitality of suitable boxes or other artificial nesting places.

This is the largest of our flycatchers; in addition to its size and distinctive call, the crested head, olive-brown upper parts, grayish breast, sulphur-yellow belly and, from below, rufous inner webs of the tail feathers characterize it.

Eastern Phoebe. *Sayornis phoebe* (Latham).

In the Oneida Lake region the phoebe and the kingbird vie with each other for first place as to relative abundance among the flycatchers. I think the advantage is with the kingbird. However, it is a little difficult to compare the two species, for their apparent maxima are not attained at the same time; the kingbird reaches its maximum after the phoebe has begun to nest. Different types of habitat also are chosen by the two. Without doubt, however, the present species is commoner than the kingbird in the immediate vicinity of the lake.

The phoebe is the first of the flycatchers to arrive from the South—it winters from Virginia to Central America—and I have seen it in some numbers about the celery fields at Sanford, Florida, throughout the winter months. Of course it has put in its appearance at Oneida Lake long before my observations have begun. Eaton (1914, p. 187) says that "It arrives from the south from the 15th of March to the 10th of April and departs for more southern latitudes from October 15 to 30." Sadler (1926, p. 11) reports it from the Syracuse district as early as March 4 and the earliest nesting date as April 28.

This flycatcher occurs in numbers all around Oneida Lake both in the vicinity of villages and cottages and in thinly populated outlying districts that contain ponds or streams. Situations of the kind the phoebe prefers for nesting sites are plentiful, and doubtless account in part at least for the numerical status of the bird. Numerous summer camps and cottages line the lake shore, particularly on the south and east sides, and bridges and abandoned houses are common on the north side of the lake. Neither the mixed nor the hemlock woods of the north-side districts attract the phoebe, but the low-lying areas that prevail in the Sylvan Beach, Maple Bay, Lower South Bay and Short Point districts and the Cicero Swamp southwest of Clay are typical of the local situations in which the bird is most commonly found in greatest abundance. However, the phoebe not

infrequently occurs some distance from water; on July 17, 1928, I saw a bird of the year in the Wright woods a mile from the nearest water, Oneida Lake.

A habit that the phoebe shares with the other members of the family is often exhibited in selecting some vantage point such as the end of a stick projecting from the water, the stake of a boat dock, the low limb of a tree overhanging the water or the abutment of a bridge, from which it may dart out to seize a passing insect. It returns to the same perch after the quest and repeats the performance again and again. While thus perched and awaiting the next sortie it usually utters its typical, tuneless song of two syllables "*phebe-peeree*" over and over again, accompanying it by a wagging or pumping movement of the tail. This latter habit and the characteristic note are helpful in field identification.

The earlier spring arrivals are not much given to vocalizing, but as the breeding season draws near the monotonous note is to be heard on all sides. Toward the end of July the singing ceases.

Nesting activities begin "as early as the third week in April" (Eaton, *loc. cit.*, p. 188), but my earliest date for the Oneida Lake region is May 7, when I saw a bird carrying nest material in the form of a feather, near the Fish Creek railway station. Four eggs make up the usual clutch. The following chronological excerpts from my field notes give some notion of the nesting habits of the phoebe and indicate that two broods of young are commonly reared in a season in this territory.

"May 17, 1929. Vicinity Vandercamp woods; nest with two eggs; out-building at abandoned farmhouse.

"May 23, 1928. Nest on stone pillar supporting the veranda of a lake shore cottage at Lower South Bay. No eggs as yet. On May 27 there were three eggs. On June 9, I banded four fledglings from this nest.

"May 29, 1928. Nest containing six fledglings; back porch of an abandoned farmhouse north of Shaw Point. Banded as Nos. 97933A-97938A, inclusive.

"June 3, 1929. Shed at Louis Will Game Retreat; nest with young about ready to leave; indeed, one of the birds flew out while I watched, but could not fly far.

"June 10, 1929. Nest of moss on top of drooping fold of wall paper on the wall of an abandoned farmhouse northeast of Jewell; three young three to four days old.

"June 18, 1928. Two young about ready to leave nest, on porch of summer cottage at Gordon's Pond; banded. The temperature of these young birds was 109.0° and 108.0° F. respectively—rather high for young passerine birds. These young phoebes were very lousy, but seemed nevertheless to be in a thriving condition.

"June 25, 1928. Fish Creek Landing district. Saw an adult and one young perched on a twig overhanging a shallow, lily-covered pond. The parent flew down to near the surface of the water at frequent intervals to seize an insect, then returned to the branch and fed the young one. This performance was repeated several times. The youngster was perfectly able to fly and, indeed, after a few minutes demonstrated that it, too, could catch insects after the manner of its parent. Perhaps it was taking lessons in the art of catching flying insects.

"July 3, 1929. William Parker farm two miles southwest of Lakeport. Nest on back porch of occupied house. Young had left within the preceding thirty-six hours.

"July 5, 1929. Nest with three young, one to two days old, and one egg; back porch, deserted farmhouse one mile south of Lakeport. On July 11, four young were in the nest and all were furnished with bands. Nos. 40-14B-40-17B, inclusive.

"On July 30, 1928, young birds not long out of the nest were observed at Bullhead Bay near Constantia."

It seems evident, therefore, that the breeding season extends over a considerable period of time and I suspect that in certain favorable summers even an occasional third brood is reared.

Not only is the food of the young made up almost entirely of insects, but also that of the adults. Among the noxious insects taken freely by the phoebe may be mentioned flies of various kinds, including the house fly and the mosquito, moths and butterflies and their larvae, including the cankerworms, woolly bears, codling moths and others; many kinds of beetles, particularly the leaf-feeders, grasshoppers, ants and other forms that can be easily spared at least so far as man's well-being is concerned, but also some useful parasitic and predacious insects as well as honey bees fall prey to the phoebe. However, the beneficial forms are in the minority. Practically all the insect food is taken while the bird is on the wing.

During the early and late cold months of the year when insect food is at its minimum the bird becomes more terrestrial in its habits, feeding upon small seeds, wild berries and the like. Sometimes on early spring days several birds will congregate in a sunny place near a lake or small stream, perching on low branches of trees or shrubs and from these vantage points sallying forth after insects that have been stirred into activity by the pleasant warmth.

Yellow-bellied Flycatcher. *Empidonax flaviventris* (Baird and Baird).

During the 1928 season I saw this easily recognized little flycatcher only once in the Oneida Lake region. On May 31, in the tall willows on the high bank of the lake shore on the east side of Shackelton Point, I saw a single individual. In the 1929 season I was more fortunate and saw this flycatcher on four out of six field trips taken on successive days between May 23 and May 30, to territory immediately joining the lake on the north and east. At the edge of the beech-maple-hemlock portion of the Vandercamp woods I saw one on May 23 among low bushes; one in the willows along Fish Creek near the village of Fish Creek Landing; two in the tall trees on the high lake shore at the Catholic Cemetery just east of the village of Cleveland; one in a white birch and alder thicket a mile northeast of the village of Sylvan Beach, and another in the woods at Sylvan Beach. Apparently it was commoner and more generally distributed in the region during the latter season, but it can scarcely be called a common bird here. Incidentally it may be stated that the Sylvan Beach district is one of the best places in the region to find flycatchers. On May 29, all seven of the commoner representatives of the family, the kingbird, crested flycatcher, phoebe,

wood pewee, yellow-bellied flycatcher, alder flycatcher and least flycatcher were noted here.

The yellow-bellied flycatcher is reported to be a fairly common migrant in most portions of New York, arriving from the South during the first half of May. By late May or early June it has passed northward to its breeding ground which includes the Canadian zone of the State. It is not uncommon as a summer resident in parts of the Adirondacks. Tully, some twenty-five miles south of Oneida Lake, and Peterboro, about fifteen miles southeast, are mentioned by Eaton (1914, p. 193) as localities where the bird has been found during the summer. Systematic observations in the Oneida Lake region over a series of years would possibly reveal its presence here during the breeding season. The southward movement to Mexico and Panama begins early in August and is completed by mid-September.

While my records above listed indicate that this flycatcher frequents a variety of habitats during migration, I have never found it far from water. It is not a bush- or tangle-inhabiting species, but perches conspicuously on the tops of small trees or on the outer lower branches of larger ones.

The olive-green upper parts and the yellow under parts of this flycatcher will serve to distinguish it from others with which it might be confused.

Alder Flycatcher. *Empidonax trailli trailli* (Audubon).

Of the six species of flycatchers that I have found during the summer in the Oneida Lake region, the alder flycatcher ranks fifth in point of numbers.

My earliest spring record is May 25, when I saw a single bird in the low, boggy part of the Emmons woods west of Big Bay, but I have no doubt that individuals of the species arrive here at least a week or ten days earlier. My latest summer date is August 1, but it is likely that a few may be found throughout the month. The winter home is Central America.

Reports indicate that the alder flycatcher has become more widely distributed in the State in recent years, and although its breeding strongholds are still in the Catskills and the Adirondacks it is found throughout the summer in many other parts, the Oneida Lake territory included. Here, while it is not a common bird, its "wee-zee-up" note is not infrequently heard from the vocalist on the top of a willow or alder bush in a low-lying thicket. Without question, this flycatcher was commoner in the 1929 season than in 1928.

In the Oneida Lake territory I have usually found this flycatcher either in thickets of willow, or mixed alder and willow, in low boggy places at the edges of woodland or along small meandering woodland creeks. On May 28, in a white birch and alder thicket a mile northeast of Sylvan Beach, I found all three species of small flycatchers, the yellow-bellied, the least and the alder. While the bird often seeks a high perch from which to sing, at other times it remains well concealed in its swampy thickets. These tangles are often near woodland, but the bird does not wander far into the heavier growths. Suitable situations for it are less frequent on the south side than on the north side. Other localities in which I have found the alder flycatcher include the Gordon Pond district, Widrig woods three miles northeast of Cleveland, alder

thicket about a mile northeast of Jewell, willow thickets southeast of Vandercamp woods northwest of the village of Cleveland, willow swamp three and a half miles southeast of Bridgeport, alder thicket one-half mile northwest of the Fish Creek railroad station, and the willow thickets bordering Wood Creek not far away.

As noted by Silloway (1923, p. 467), I, too, have found that during the breeding season the alder flycatcher is "more demonstrative and aggressive than most of the other birds nesting in the same habitat." Its activities are, however, well screened by the foliage. The song sparrow, swamp sparrow, chestnut-sided warbler, Canada warbler, and Maryland yellow-throat are often found in the same situations as this flycatcher. Its method of catching insects is the same as for the other members of the family.

The nest of the alder flycatcher is usually found in the crotch of a small bush or sapling near the ground, "but in some instances it saddles its nest on a horizontal branch from twenty to thirty feet from the ground." (Silloway, *loc. cit.*, p. 467.) Coarse grasses, plant down and fibers with a lining of fine grasses make up the nest. On June 10, 1929, in an alder and willow thicket in a boggy creek bottom two miles north of Cleveland I saw this flycatcher carrying nest materials. The eggs, usually three, are laid during the first half of June. Eaton (1914, p. 196) records this flycatcher as breeding in Oneida County, while my own observations of the nesting were made in the extreme eastern part of Oswego County.

The note "*wee-zee-up*," or, what to my mind characterizes it more precisely, the "*tick-weech*" of Saunders, or the "*krateel*" of Miller is apparently subject to a good deal of individual, seasonal or geographic variation. This note together with the bird's slightly larger size, browner coloration above and light-colored lower mandible will serve to distinguish the alder flycatcher from the least and the Acadian, with either or both of which it may be confused.

Least Flycatcher. *Empidonax minimus* (Baird and Baird).

This is the smallest of our flycatchers. It is a fairly common summer resident in both the wooded and the more settled districts of the Oneida Lake region. My earliest spring record is May 10, when a single individual was noted in a tall maple on the lake shore at Lower South Bay. However, I suspect that the bird arrives in the region at least a week earlier. It is most frequently seen about gardens, orchards and roadside trees, where it sits erect upon a high limb, persistently uttering its monotonous "*chebec*"—responsible for one common name.

The least flycatcher shows little fear of man and will permit close approach. The vicinity of cottages and camps about the lake seems to appeal to it, and I have often heard it at Cleveland, Maple Bay, Sylvan Beach and Lower South Bay. Other districts in which I saw it in some numbers are Louis Will Game Retreat, Little and Big Bay districts, Jewell and vicinity, Hitchcock Point district and Vandercamp woods, as well as other wooded sections on the north side of the lake. As a matter of fact it may be seen in the taller trees all about the lake, but I have found it most common in or adjacent to the north side wooded sections. During the nesting season one can always be sure of seeing or hearing

a number of these birds in the tall maples overhanging the highway immediately east of the business section of the village of Cleveland.

This flycatcher is most in evidence here through the month of June; it is mid-May before its maximum abundance has been reached and after the first few days in July it is much more quiet and retiring. In late July and in August I have seldom seen it. Early in September the autumnal movement to the winter quarters in Mexico, Central and South America begins, and by the close of that month all have departed.

In addition to the *chebec* note—which may be repeated a few or many times with varying intervals and the utterance of which is accompanied by a slight jerk of the head—the least flycatcher has a sharp call note that may be written “*whit*.” Often during the nesting season I have heard also a low twittering “*whit—wee-wee*” from the bird when disturbed. This song, if it can be called such, is rather rasping and unmusical. After the breeding season the bird loses most of whatever vocal ability it possessed earlier, but the *chebec* note is retained longer than the others.

The usually three or four white eggs of the least flycatcher are deposited in a nest made of plant down and fibers together with a few grasses and rootlets, placed in the fork of a bush or tree ten to thirty feet above the ground. Regarding this species in the present area Sadler (1926, p. 11) says: “Watched one building a nest on May 13 and 14, 1922, at Constantia. It was in the crotch of a small tree, twenty feet above the ground.”

About one-half of the least flycatcher's food consists of Hymenoptera, sometimes called four-winged flies; the bulk of the remainder is made up of beetles, two-winged flies, true bugs, moths, caterpillars, grasshoppers and spiders. Very little vegetable food is taken.

The small size—5.00 to 5.50 inches—whitish under parts with a grayish brown wash across the breast and yellowish on the flanks, together with the usually brownish lower mandible, will aid in the field determination of this species. But the most distinctive field character is its unique call note.

Eastern Wood Pewee. *Myiochanes virens* (Linnaeus).

The wood pewee is a common summer resident and breeds in the wooded tracts, groves and forests throughout this territory. While my earliest date for it here is May 13, from the Bridgeport district, the species may be expected about ten days earlier. It does not become common until late May. Seldom is it observed in autumn after late September.

In this territory the wood pewee is probably next to the kingbird in point of numbers of the flycatchers, although the phoebe at times seems to share this rank. Be that as it may the wood pewee is a very common woodland bird, and its plaintive “*pe-a-wee-ee*” is one of the songs most frequently and persistently heard through the summer season proper. I have not often seen the bird about farm houses or orchards here for it seems to prefer the sparsely wooded sections and margins rather than either cultivated areas or deep woodland. Nor is it a bird of the undergrowth. It is a bird of the lower limbs of moderately dense deciduous or mixed woods, or about clearings in such tracts.

Some of the localities in which I have found the wood pewee most abundant here are Hitchcock Point, Emmons' Woods, Jewell and vicinity, Sylvan Beach, Cicero Swamp, Panther Lake, Oak Orchard, and the Parker woods. It is also found on Dunham and Frenchman islands and, I believe, nests there.

The sweet melancholy note of the wood pewee may be heard in the woodland all day long from mid-May until mid-August. The bird is almost as tireless a songster as the red-eyed vireo, and on a hot summer's afternoon these two birds are almost the only ones that keep singing. Like many other birds the wood pewee performs at its best early in the morning, but sings a good deal also toward evening. It resembles in this respect somewhat the veery and wood thrush. After mid-July the song wanes. The three parts of the "*pee—a-wee*" song "are slurred together, the first usually highest in pitch, the second lowest and the last medium. Sometimes the bird sings only the first two notes 'pee-ah' and again only the last two 'ah-wee-ee.' The last note is often given a slight upward slur of about half a tone" (Saunders, 1923, p. 304). Frequently both notes are sung, but a considerable interval intervenes between their utterance. Not infrequently amateur observers announce enthusiastically that they have heard the "pewee" in mid-winter or in very early spring. Of course it is the note of the chickadee that has been mistaken for that of the wood pewee. One who is familiar with either call will experience no difficulty in distinguishing them. When the wood pewee is disturbed it utters a low "*chit*."

Partly on account of its secretive ways during the breeding season, the nesting activities of this woodland flycatcher are likely to be overlooked. Its nest of small twigs, rootlets and grass overlaid on the outside with grayish lichens is placed on the horizontal limb of a tree, often a dead one, at a height of ten to thirty feet from the ground. The three or four eggs are usually laid in June. On July 30, at the edge of the woods near the Fish Creek railroad station, I found an adult accompanied by young of the year able to fly.

Owing to its abundance, its wide distribution in the State and to the nature of its food habits, the wood pewee is considered a valuable species. A few wild fruits are eaten in small amount, and spiders and millipeds are taken in small numbers. "The remainder of the food of the wood pewee consists entirely of insects. The more important groups are flies (about thirty per cent of the total food), Hymenoptera (twenty-eight per cent), beetles (fourteen per cent), Lepidoptera (twelve per cent), bugs (six per cent), and grasshoppers (three per cent)." (McAtee, 1926, p. 47.) While this bird takes a few beneficial insects, the preponderance of its insect food is inimical to agriculture, horticulture and above all, to forestry. It has a habit of perching in some favorable spot at the edge of woodland where it may dart out to seize flying insects. The snapping of its mandibles can be plainly heard. After each sortie the bird returns to its perch.

The dark grayish brown upper parts, the prominent whitish wing bar, and the grayish under parts, somewhat darker on the breast, are helpful field characters. The feathers of the crown are somewhat lengthened and are often erected, especially when the bird is disturbed. The note of the wood pewee is most distinctive for identification.

Olive-sided Flycatcher. *Nuttallornis mesoleucus* (Lichtenstein).

On one or two occasions I thought I saw this flycatcher in the pitch pine and oak woods on the high sandy ground east of the village of Sylvan Beach. But each time the bird flew away before I was able to satisfy myself conclusively as to its identity. The general appearance and type of perch selected certainly suggested the olive-sided flycatcher. Sadler (1926, p. 11) records one "near Verona Beach, Oneida Lake. on June 20, 1920." Eaton (1914, p. 190) says: "It has been reported by Mr. Maxon as breeding in Madison County especially about the eastern end of Oneida Lake." Eaton (1910, sec. 3, pt. 14) records it also as breeding in Oneida County.

Throughout most of New York State the olive-sided flycatcher appears to be an uncommon transient, but it is said to be a common breeding bird in the Catskills and the Adirondacks. It is likely to put in an appearance in the Oneida Lake region during the latter half of May and to pass on north by June 1. The above records of its occurrence in this section indicate that it also may be present as a breeding species.

The dark brown plumage of this large-headed, plump-bodied flycatcher is distinctive. The bird often perches at the top of a tall tree as he utters his typical note "*gree deal*."

LARKS: FAMILY ALAUDIDAE.

Prairie Horned Lark. *Otocoris alpestris praticola* Henshaw.

The prairie horned lark occurs as a summer resident—and possibly also as a permanent resident—in the region. In the 1928 season I saw the species but five times, and then only a single individual on each occasion. The dates and localities are as follows: May 8, roadside fence post near West Monroe Cemetery; May 22, plowed field in Short Point district; May 29, roadside, Shaw Point district; June 19, roadside, West Monroe district; and August 4, graveled highway, Oneida Valley district.

During the 1929 season the bird appeared to be much commoner and more generally distributed. A considerable number of individuals were seen in widely scattered territory and at various times throughout the summer.

It is likely that the species is to be found here every month of the year except, perhaps, December and January. Early in February, however, migrants may be expected to arrive. My earliest record in 1929 was May 9, when, in an open plowed field and the adjoining meadows three miles south of Lower South Bay several horned larks were seen in company with a small flock of pipits. The horned larks were in full song and seemed to prefer the plowed ground to the grassy field. On subsequent occasions they were seen in freshly plowed or disked fields.

Several times during the summer, birds were seen in the Cicero, Clay, Ontiontown, Lakeport and Oak Orchard districts. The considerable expanses of open, slightly rolling fields in these sections appeal to the birds more than the low, flat, marshy expanses found near Oneida Lake. The Lakeport, Oneida Valley, and State Bridge districts seem to be the center of local abundance. Once

on July 27, I saw a single bird in a very stony plowed field one-half mile east of Kibby Lake. I was rather surprised to find this species in an area so closely surrounded by heavy woodland, but apparently the high, open, rocky fields and meadows on the north side of the lake present some attractions for these prairie-loving birds.

While the results of the two seasons do not show the prairie horned lark to be a common bird in the Oneida Lake region it is quite possible that it is more plentiful than our actual records indicate. However, at no time did I see large flocks of the birds, but only single individuals or groups of four to eight or ten.

Apparently the prairie horned lark gradually has been extending its range from the western prairies to the eastward and, at the same time, increasing in numbers. With respect to its incursion into New York State, Eaton (1914, pp. 203-204) says: "While many of our valuable song and insectivorous birds have been diminishing in numbers, this species has gradually increased year after year, until at the present time it inhabits the greater part of the State as a summer resident."

Not only is this horned lark an early migrant, but it is an early breeder as well. Eaton (*loc. cit.*, p. 204) records the finding of eggs at Rochester on March 11 and (1910, sec. 3, pt. 14) cites it as breeding in Oneida County on March 15 and May 11, thus indicating that two broods are reared in a season. He records it also as breeding in Oswego, Onondaga and Madison counties.

The nest of grass is said to be placed in a slight depression in a pasture or meadow. Usually four eggs make up a clutch; they are grayish white, thickly and finely spotted with light brown.

The prairie horned lark is a gregarious and highly terrestrial bird, and I have never seen it perch at a greater distance above the ground than the top of a roadside fence post. It often frequents the vicinity of roadsides where, not uncommonly, it is mistaken for a "sparrow" as it runs along the highway in advance of the pedestrian or motorist. When pressed too closely it often flies ahead for some distance, there to resume its running, or it may alight in a near-by field.

During the breeding season the males often sing on the wing, sometimes mounting to a great height as they utter their high-pitched, twittering song, then dropping quickly to earth again. I have heard the birds singing freely as late as July 2, some time after the breeding activities must have been concluded. On occasions I have heard the birds sing while flying a few feet above a meadow, and again while perched on a haycock.

Immediately following the nesting season, small groups of birds of the year accompanied by adults wander about over the fields and along the roadsides. I have often come upon the members of such groups dusting themselves in the highway. The largest flocks are most likely to be found early in the spring and late in autumn.

Studies of the food habits of this bird made by the U. S. Biological Survey show that about four-fifths of its food consists of vegetable matter comprising grain and weed seeds in approximately equal amounts. Insects including beetles, butterflies, moths, grasshoppers, ants, flies and hymenopterans made up the bulk of the remainder. I have observed the birds here on recently sowed grainfields

and it is possible that they may take such food, but I doubt the species is abundant enough in such situations to exert any material influence one way or the other. On the whole, so far as man is concerned, the food habits of the horned lark are in the main beneficial.

Upper parts light brown, more or less tinged with vinaceous; a black stripe on either side of the head; forehead and line over the eye whitish; ear tufts or "horns" erectile, black, arising from the sides of the forehead; tail black. Under parts white; throat white or buff slightly tinged with yellow; a crescent-shaped black patch in middle of breast.

SWALLOWS: HIRUNDINIDAE.

Tree Swallow. *Iridoprocne bicolor* (Vieillot).

This is the first swallow to reach us in spring from its winter quarters in the Southeastern and Gulf states, Cuba, Mexico and Central America. It evinces a liking for the vicinity of water and particularly for flooded swamps and marshlands containing a stand of dead timber and hollow trees for nesting purposes. Such areas are of frequent occurrence in the Oneida Lake region. That the tree swallow responds to these features is indicated by the fact that it is one of the commonest birds locally, at times I believe even surpassing the barn swallow in abundance. Early spring arrivals may be looked for about April 1, while the principal autumnal movement occurs during the first three weeks of October.

The tree swallow or white-bellied swallow is more uniformly distributed throughout the region than is any one of the other swallows. The low-lying flats along Chittenango Creek at Hitchcock Point bear an abundance of old willow stubs and stumps many of which the birds utilize. Similar conditions prevail in the Shaw Point, Short Point, Lakeport, Cicero Swamp, Panther Lake and Gordon Pond districts. At the last named place are a great many decaying stumps standing in the shallow water, in which these tree swallows nest (Fig. 213). I also have found the bird on both Frenchman and Dunham islands, and in late summer it courses about Wantry and Long islands, feeding upon the myriads of mayflies that occur there.

This is one of the species that is markedly commoner on the south side than on the north side of Oneida Lake. About Lower South Bay, for example, it is by far the commonest swallow and, indeed, much the same situation prevails in the immediate vicinity of the lake and eastward to the village of South Bay. At many of the cottages and farmhouses in the Lower South Bay and other districts to the south and east, numbers of nesting boxes have been erected to attract these swallows.

Tree swallows are excellent fliers and are even more pugnacious than the barn swallow. At Lower South Bay it became necessary for a pair of these birds to dislodge a pair of English sparrows from a nesting box that appealed to them.

In early May, in the Lower South Bay district, I have seen birds flying over the lake suddenly dive into the water so that for an instant the entire



Fig. 204. Adult tree swallow and stump containing nest and eggs from which the incubating bird was taken. Chittenango Creek. May 28, 1928.



Fig. 205. Adult banded tree swallow. May 28, 1928.



Fig. 206. Barn swallows on telephone wires, Cicero Swamp southwest of Clay. August 9, 1928.

front part of the body was immersed. Evidently the birds were feeding on aquatic life of some sort.

This swallow possesses a weak twittering note not unlike that of other members of the family. During the nesting season its notes take on a more pleasing and musical quality.

Early in the season the tree swallows and others associate together freely, hawking for insects over the lake and the outlying ponds and creeks. However, family affairs receive the attention of this swallow earlier than in the case of the others and pairs soon disperse to seek out nesting places.

Not only does the tree swallow nest in hollow trees and abandoned woodpecker holes that are plentiful in the territory and which form its natural nesting places, but also it takes advantage of the nesting boxes that have been liberally distributed for its occupancy.

It seems that these birds here occupy the natural nesting sites offered, earlier and more readily than they do the nesting boxes provided for them at various points about the lake. I believe that a second brood is more likely to be reared in such semi-domestic situations than under wild conditions.

Nesting materials consisting mainly of grasses, straw and feathers are carried to the selected nesting cavity where in due time the four to seven white eggs are deposited.

I have seen the birds mating on May 1. On May 3, 1928, I saw a pair building a nest in an abandoned woodpecker hole in a hard maple tree by the roadside and close to a frequently visited road-house, at Maple Bay; and five days later I saw a bird nesting in a hollow willow at Lakeport.

From this time on throughout May and well through June birds were frequently observed carrying nesting materials, and nests containing eggs or young were found in several localities.

On May 28, 1928, a nest containing eggs was found in a hollow willow stump on the bank of Chittenango Creek near its mouth (Figs. 204 and 205). The nesting cavity communicated with the outside by means of two openings, one in the top and one on the side of the stump. The incubating bird was captured and banded after taking her temperature (107.4 degrees F.) (Fig. 205). About June 20, young birds just out of the nest appear in numbers and take up their places together with others of their species and barn, bank and cliff swallows as well, on roadside telephone wires and trees where they are attended by the parents for some days, and accompanied by them on short forays for flying insects. In the Shaw Point district, June 22, 1928, several young out of the nest were seen on telephone wires and dead branches of trees. On June 22, 1929, a nest containing four young ready to leave within four or five days was found in a hollow willow stump five feet above the waters of Chittenango Creek (near the point where the nest was discovered on May 28, 1928). While I banded the young, the adults, both carrying mayflies in their bills, perched on a nearby twig and watched the proceedings.

Nesting birds were also discovered along Black Creek, southeast of Bridgeport, and in the Big Bay swamp. At Francis Pond, northeast of Constantia, I believe that the tree swallow nests in numbers in the old stumps in the pond.

Indeed, much of the territory about Oneida Lake is of the type that appeals to this bird.

My belief that a second brood is reared in this region is based principally upon observation of tree swallows occupying nesting boxes, and the fact that I have seen birds mating as late as July 8. At the Pattat residence in the Lower South Bay district, special effort is made to entice this bird in numbers by means of nesting boxes. Most of these houses are usually inhabited. On July 4, 1928, young about a week old were in one of the boxes; and even as late as July 14, young were still in the nests in some of the boxes here. On the other hand, it is only fair to state that at this time many more young were out of the nest that were still unable to fly. Indeed, from July 1, young out of the nest rapidly became abundant and joined the throngs of barn, cliff and bank swallows that were so common on roadside telephone wires. Mr. Pattat told me that about July 12 he had counted thirty-five tree swallows on a twenty-five-foot span of electric light wire stretched between his house and garage. At intervals great flocks of these birds fly to and from the near-by trees and the lake shore some 200 yards away. The bird is commoner in this immediate territory than I have observed it elsewhere about Oneida Lake.

Throughout the latter days of July the number of young tree swallows occupying points of vantage along the roadside is constantly augmented, but at the same time fewer and fewer adults are to be seen. Apparently the adult birds flock to the outlying marshes earlier than either the barn or the cliff swallow. Early in the morning the young birds often rest on the paved highways which have been warmed by the sun, and in so doing numbers of the birds are killed by passing motor cars.

In late July and throughout August the tree swallow along with other swallows visits freely the small grass-covered islands in Oneida Lake, where all feed upon mayflies which are so abundant at that season. On August 8th, 1928, I saw several birds thus feeding both at Long and at Wanry islands.

Even early in July, groups of young birds perch in the tall trees along the lake shore in the Lower South Bay and other districts.

At this time, too, the adults begin to wander more widely and mingle with the barn swallows and other swallows, feeding with them over the swamps and marshes. On one occasion in the Cicero Swamp south of Clay I counted thirty-six barn swallows and three tree swallows on telegraph wires, all within compass of my kodak (Fig. 206).

Sometimes the young birds accompany the adults on feeding excursions or strike out for themselves, but for the most part they seem willing to let the parents capture their food for them. On several occasions I have seen a young bird being fed by the parents as they hovered momentarily over it. Again the adult may perch for an instant beside the young bird, deliver the food, and then dart away.

The studies of Beal (1918, pp. 15-19) reveal that, while this swallow is highly insectivorous in its food habits, it takes a greater amount of vegetable material than do any of the other representatives of the family, about twenty per cent, of which the fruit of bayberry (*Myrica carolinensis*) forms the major

portion. In addition it is known to eat the fruits of red cedar, rough-leaved cornel and Virginia creeper.

Of the eighty per cent animal food comprising the diet of the tree swallow, two-winged flies (Diptera) constitute about forty-one per cent, beetles (Coleoptera) about fifteen per cent, ants and other Hymenoptera about fifteen per cent, moths and their larvae (Lepidoptera) five per cent, and true bugs (Hemiptera), mayflies (Ephemera), dragonflies (Odonata) and grasshoppers (Orthoptera) the remainder.

The wild fruit taken by this bird has no direct bearing upon man's interests but certain items of its insect food, namely the parasitic and predacious Hymenoptera, the carnivorous Diptera and the predacious beetles are beneficial forms. On the whole, however, the value of the tree swallow in destroying great numbers of noxious insects far outweighs its harmful tendencies of eating useful insects, so that it is a bird altogether worthy of encouragement and protection.

The plain steel-blue or steel-green upper parts and white under parts, together with the slightly forked tail are distinctive features.

Bank Swallow. *Riparia riparia riparia* (Linnaeus).

Although the commonest swallow in the region, probably ranking ahead of the barn swallow in point of abundance, the present species (called also sand martin) is even more confined locally in its distribution than is the cliff swallow. It is the smallest of our swallows. Except at the extreme east and west ends of the lake, comparatively few precipitous sand and gravel banks such as appeal to the bank swallow occur, so that it is to be found locally in a comparatively few districts.

The first spring arrivals may be expected toward the end of April when, from that time until the nesting season is well under way in mid-June, they may be seen in numbers coursing about over lakes, ponds and streams in company with barn, cliff and tree swallows. On May 12, 1928, where the State road crosses Chittenango Creek at Bridgeport I had the good fortune to see at the same time all the five species of swallows proper that occur in the region. About 100 individuals, but mostly barn and bank swallows, made up the lot that was hawking to and fro about the waters of the creek.

Well-marked waves of arrival occur not infrequently in May. A field note under date of May 12, 1929, states that "This bird has become much commoner during the past twenty-four hours. Here at Lower South Bay the bank, barn and tree swallows are performing aerial acrobatics together along the lake shore this evening."

The bank swallows disappear in late summer earlier than the other swallows, the autumnal movement being well under way by September 1. The winter home of the present species is probably in South America.

The bank swallow exhibits a preference for the vicinity of water, seeking its insect prey over the surface of streams, creeks, rivers, lakes and ponds, and excavating its burrows in their precipitous sandy or gravelly banks. Often such banks occur only along bodies of water, but not infrequently the banks of man-made excavations, such as sand and gravel pits, and situated perhaps some dis-

tance from water, attract hosts of these colonial birds, where their numerous burrows may at times be found spaced only a few inches apart.

The principal local nesting places and concentration points that I have found in the area here concerned are the banks of Fish Creek, for some distance upstream from Sylvan Beach, but particularly in the vicinity of Fish Creek Landing; a large roadside gravel pit on the south side of Oneida River in the Oak Orchard district, and a large sand pit on the Dutcher farm not far away (Fig. 209); a sand pit on the Delahunt property just northeast of Cleveland, and a large sand pit near McConnellsville. These, together with the precipitous banks of a few small creeks, such as the one near the State road on the Godfrey farm west of Jewell, and a few scattered roadside excavations are the principal nesting sites where I found this bird in any numbers.

By far the largest nesting community mentioned is the one on Fish Creek opposite the village of Fish Creek Landing (Figs. 207 and 208). Indeed, in 1928 this was one of the largest single colonies that I had ever seen; but here, as elsewhere, the size of the colony seems to fluctuate considerably from year to year. There was a much smaller number of birds in this colony during the 1929 season.

At this point the creek is about forty yards wide and the banks rise to a height of five to ten feet or more. The village occupies both north and south banks of the creek while opposite it and stretching away southward are low open pastures. Portions of the sheer sandy banks fall away from time to time, but only a narrow strip of low beach remains near the water line, for the sand that has slumped is soon washed away by the stream. Hundreds, even thousands of burrows have been excavated by these industrious birds, and while the burrows are not confined to the creek banks at this point only, they are more numerous here than elsewhere in the region. In some places the burrows are very close together, in others farther apart. Often groups of twenty to thirty burrows are found close together, with intervening groups more widely spaced. The bank is composed of fine sand, and some of the burrows—indeed, most of the ones examined—were three feet or more in depth. Our studies in the Lake Okoboji, Iowa, region (Stoner, 1925, 1926 and 1928) indicate that in general, if the soil in which the excavating is done is fine and loamy and the digging comparatively easy, the burrows are made deeper than where more difficult gravelly conditions are encountered. Early in the season as the banks slump away the birds gradually prolong their labors to meet the emergency, but once the nest is begun no further digging is attempted, with the result that frequently nests containing eggs or young birds are precipitated into the stream by the falling away of the bank (Fig. 211). Similar disasters to both eggs and young happen also through activities of man, as for example the following.

The bank swallow colony at the Delahunt sand pit just northeast of Cleveland occupied the precipitous sides of a shallow but extensive excavation from which sand was taken in commercial quantity almost daily. A dredging outfit on a scow in the water in one part of the pit served as a conveyor of the product and within ten yards of this outfit the birds had constructed numerous burrows. As the dredging proceeded these habitations and their eggs and young all

met with disaster. Other parts of the pit more distant from the dredge also were occupied by the birds. It has been our observation here and elsewhere that this swallow prefers a nesting site in the vicinity of human habitations or in a sand or gravel pit that is being worked rather than in an abandoned one. At the Delahunt pit as well as in other localities it seemed that equally good and much safer nesting sites were to be found in the less frequented or wholly unworked banks (Fig. 210).

The nest of the bank swallow is placed near the slightly enlarged inner end of the burrow. It is composed of straw and grass and scantily lined with feathers, ordinarily white ones from the domestic fowl. From four to six white eggs make up the usual clutch. While it is evident that a second brood is reared in the Oneida Lake region during the season, this seldom contains more than two or three young.

The nests of bank swallows are comparatively clean while the young birds are small, but as they become older and the time of leaving the nest approaches, the parents are not so punctilious in the matter of carrying away the pellets of excrement.

Toward the middle of May the birds begin to give up their wandering ways and to concentrate about the future nesting places. Here they mate, excavate their burrows and wheel and circle about above their retreats, darting in and out of them at frequent intervals and altogether display great activity. These activities are accompanied by an almost continuous harsh twitter. After the eggs are laid and incubation begins, comparative quiet reigns for a time, until the young require attention, when ceaseless industry again prevails.

Although my first record of a nest with young is June 18, 1928, first-brood eggs and nestlings may doubtless be found in this territory much earlier in the season. Sadler (1926, p. 16) gives as the earliest nesting date May 10, 1912, at Rice's gravel bed just south of Syracuse, and although I have not examined burrows thus early in the season, it is not unlikely that completed nests with eggs may be found about Oneida Lake as early as May 15. However, on May 18, 1929, the birds had scarcely begun to excavate. Our observations both here and in Iowa show that among the birds occupying a given region, considerable variation occurs in the time of laying of the first clutch of eggs.

On June 21, 1928, in the low but steep banks of a small creek on the Godfrey farm about two miles east of Jewell I dug out a nest of full-fledged bank swallows that perhaps would have left their home within a week. Two days later I opened three more burrows here, one of which contained eggs and the other two, nestlings. At the large sand pit on the Dutcher farm in the Oak Orchard district, I found incubating birds on June 27, 1929. The day previously, in the colony at Fish Creek Landing, I found that a good many young were already out of the nest while most of those in other burrows were about ready to leave. Evidently incubation and rearing of the young proceed more rapidly here than in places where family duties are more or less frequently interrupted by intruders.

The evidence at hand all points to the fact that by early July at the latest, practically all the first brood young are out of the nest, and they, with the



Fig. 207. Bank swallow burrows in bank of Fish Creek at village of Fish Creek Landing. July 12, 1928.



Fig. 208. Near view of bank swallow burrows in sandy bank of Fish Creek opposite village of Fish Creek Landing. July 12, 1928.



Fig. 209. Burrows of bank swallows in sand pit. Oak Orchard district. July 9, 1928.



Fig. 210. Burrows of bank swallows at Delahunt sand pit near Cleveland showing proximity of burrows to a more or less constantly used sand pump. July 23, 1928.

parents, have left the smaller outlying places to join the larger colonies, or to congregate along telephone or telegraph lines skirting the swamps and lakes about which they feed and in which they spend the night along with other species of swallows. The Cicero Swamp south of Clay is one of these congregating places.

However, it is evident that by no means all of the adult birds are satisfied to rear a single brood, for while a majority of the burrows in the Fish Creek, Oak Orchard and other districts that were occupied in June are now empty, later on some of them at least contain incubating birds and nestlings well through July. For example, at Oak Orchard on July 21, 1928, very small nestlings were found, while in the Fish Creek district young birds not more than eight or ten days old were found as late as July 30, 1929, and as late as July 12, I have seen the birds in copula. These facts lead to the conclusion that first-brood young are well out of the nest by late June, and that at least a small second brood is reared which leaves the nest late in July.

Sometimes nestlings are found with parasitic dipterous larvae (*Protocalliphora* sp.) attached to the head or feet. One such nestling at the Delahunt sand pit on June 23, 1928, bore one of these larvae on the right loreal region. The larva was about four millimeters in length, and surrounded by blood which had been caused to flow by the action of the larval mouth parts. The parasite was removed from the young bird, which in spite of the handicap appeared to be in a flourishing condition. I have found similar larvae on several occasions in the course of my studies of this bird in Iowa.

By the first week in August the nesting places are practically deserted and the birds have dispersed to the lake shore, roadside telephone wires, swamps and other places to rest, preen themselves and to feed. Even as early as July 28, 1928, the Fish Creek Landing colony was broken up. A field note under this date states that "Here where so many birds were present a few days ago the burrows are all abandoned and I saw but a single bird flying over today; indeed, I saw not another individual of the species all morning." Very quickly the family groups disband, the colonial life is forsaken and a strange quietness and melancholy air pervades the once noisy sand pit and creek banks.

While the birds wander more widely now and are frequently associated with other swallows in their travels, they seem to keep to themselves more than the others of their family and do not so frequently associate with the barn, tree and cliff swallows as do these species with one another.

At this season, too, the birds are frequently seen about Long, Wantry, Willard and other grassy islands in Oneida Lake, swooping down in the tall grass to seize mayflies and other insects harbored there. At times the birds momentarily come to rest on a grass stem as they pick off the insects.

A considerable number of young birds as well as a few adults were banded in the course of our investigations here, but to date no recoveries have been reported. A detailed record of these operations will be found elsewhere in this report.

In connection with the banding operations I also have made certain studies on the temperature of the bank swallows. It has been found that, while the tempera-

ture of individual incubating or brooding birds varies considerably, the average is about 108.5° F. Of two such birds taken on July 18, 1928, one had a temperature of 106.8°, the other 108.4°.

Other information relative to the temperature of this bird may be summarized from a previous report (Stoner, 1926, vol. 34, No. 3, p. 32) on investigations in Iowa and further substantiated by our findings in the Oneida Lake region:

1. The temperature of individual adult birds varies considerably even under similar conditions and under approximately the same surrounding temperature. A range of more than 13° has been noted.

2. The maximum temperature reading obtained for an adult bird is 112.9° F., minimum, 98.8°; for immature birds the maximum obtained is 115.0°, minimum 90.3°.

3. Variation in the temperature range of immature birds is more marked than in the adults and exceeds 24° F.

4. In both adult and immature birds, sudden and often well-marked fluctuations in temperature may occur, sometimes as much as three degrees in as many minutes.

5. A well-marked, more or less rhythmic diurnal fluctuation in temperature is evident, the maximum being attained at about 3:00 P.M., while in early morning the bodily heat is at its lowest ebb.

6. The temperature of young birds increases at a fairly uniform rate, but at the time of first leaving the nest the average temperature is somewhat lower than that of the average for adults. The average rate of increase is about one-half degree Fahrenheit a day until flight ability is attained.

As might be expected, the diet of this swallow conforms well with that of its relatives, for it takes flying insects almost to the exclusion of other items. The studies of Beal (1918, pp. 21-25) show that two-winged flies (Diptera) make up about 27% of the diet, beetles (Coleoptera) about 18%, ants, mostly winged forms (Hymenoptera), about 14%, and true bugs (Hemiptera) about 8%. Miscellaneous insects, of which mayflies constitute an important part, together with dragonflies and a few Lepidoptera and beneficial Hymenoptera make up the bulk of the remainder of the food. Aside from the beneficial Hymenoptera and Coleoptera, practically all the insects taken by the bank swallow are either neutral or harmful; so far as man is concerned, the presence, general abundance and the success of this bird are highly desirable.

The small size, brownish gray upper parts, and white under parts with a pronounced gray band across the breast, are distinctive. There is a small tuft of feathers on the leg above the hind toe.

Rough-winged Swallow. *Stelgidopteryx ruficollis serripennis* (Audubon).

Although I have been on the lookout continually for the rough-winged swallow in the Oneida Lake region, I have been rewarded by a sight of it on only a few occasions, between May 12 and 28. I had expected to find at least a few rough-wings among the bank swallows along Fish Creek but saw none.

In early May, great numbers of barn, tree and bank swallows may be seen together circling and skimming over the waters of Chittenango Creek at Bridge-



Fig. 211. Nest of bank swallow exposed by falling away of sand bank. Fish Creek near village of Fish Creek Landing. Note white lining composed of feathers from domestic fowl. July 12, 1928.



Fig. 212. Burrows of bank swallows in sandy bank of Fish Creek. Note claw marks at opening of completed burrow and in the incomplete one. July 12, 1928.

port and a few times I have found rough-winged swallows with them. In late May of the 1929 season, I saw a single rough-wing near the Delahunt sand pits a mile east of Cleveland. It is possible that the species may nest in the banks of this pit along with the bank swallows, but I have never been able to discover it. So while these observations constitute my only records of the rough-winged swallow for the region it is possible that individuals or even small nesting colonies may have escaped my notice. The species is said to have increased both in numbers and distribution within recent years. Eaton (1910, sec. 4, pts. 12, 14, and 15) records it as breeding in all four counties surrounding Oneida Lake and indicates its status as fairly common to rare.

Spring arrivals of the rough-winged swallow may be expected any time after April 20. Ordinarily the species nests in small colonies of individuals of its own species, or with a colony of bank swallows. Occasionally a single pair will take up nesting quarters about a culvert or a bridge, but usually the nesting site is in a sand, gravel or shale bank. The nest is composed of coarse grass and lined with feathers, and the eggs number four to eight. By mid-September the species has departed for the South.

This bird receives its common name from the "rough" outer web of the first primary which is composed solely of a series of small recurved hooklets, not visible when the bird is in flight but easily felt on the feather itself. This feature together with its larger size and brownish gray throat and breast will distinguish the rough-wing from our other dull-colored member of the group, the bank swallow. Another feature that is helpful in distinguishing the two species in the field is the slower and more regular wing-beat of the rough-winged swallow.

Barn Swallow. *Hirundo erythrogaster* Boddaert.

This widely distributed swallow is one of the commonest representatives of the family about Oneida Lake. It is most prevalent and generally distributed about barns and out-buildings and occurs uniformly throughout the territory. Early arrivals are likely to put in their appearance here about April 15, but the maximum of abundance is not attained until well toward the middle of May. The birds depart for their winter quarters in Central and South America in the latter days of September.

The barn swallow prefers the more open situations found about farm buildings, lakes, ponds and streams, and also such places as the rush-grown parts of the Cicero Swamp south of Clay. Early in the season the birds range far and wide over the country-side, but for the most part they skim over the more heavily wooded districts. As the nesting season approaches they concentrate at farm buildings and abandoned houses throughout the region where, often in company with cliff swallows, they nest in numbers. In the early part of the season, too, the barn, cliff, tree and bank swallows, together with chimney swifts, may be seen coursing together over creeks, meadows, woodlots and ponds, where they feed on flying insects. The highway bridges crossing Chittenango Creek at Bridgeport and Fish Creek near Fish Creek Landing are good examples of such situations. After the nesting season most of the birds repair to the swamps and marshes above which they feed and in which they spend the nights.

A field note under date of July 17, 1928, sums up briefly the situation at that season of the year:

"This bird is not so common about farm buildings now for with the completion or near completion of family cares—the adults feed the young for some days after they leave the nest—the birds spend a good deal of time hawking for insects over meadows, swamps and marshes and resting on roadside telephone wires.

"At the Cicero Swamp south of Clay this species occurs in numbers and was on the wing, flying about over ponds and streams for some time after the tree swallows had settled down for the night, but by 8:30 P.M. the barn swallows, too, had settled into the cat-tails."

While it is not true in general for the region, in the Lower South Bay and most other districts immediately south of Oneida Lake the barn swallow outnumbers the cliff swallow more than ten to one. On a field trip from Lower South Bay to Clay and return on May 14, 1928, I recorded more than 100 barn swallows and but a single cliff swallow. There is no reason to doubt that the latter species definitely concentrates in more circumscribed areas here than does the barn swallow. This phenomenon is especially marked during the nesting season when about some barns the barn swallow is dominant while about other barns the cliff swallow predominates. Time after time we noted the fact that along the highway between Cleveland and Vienna the cliff swallow was more abundant than the barn swallow while the reverse situation prevailed along the highway between Cleveland and Central Square.

The barn swallow has no real song, but possesses a weak, more or less musical twitter which is often uttered on the wing. This bird is an excellent flyer and its graceful aerial circles, quick turns, side-slips and rapid darts are seldom excelled by any bird. Usually the barn swallow skims along close to the ground, or surface of the water, as the case may be, in its search for insects, while the other swallows fly somewhat higher in the air and as a rule exhibit less of a tendency to skim. Barn swallows at times dip lightly into the water in their pursuit of insects.

At all times the barn swallow, in common with the other swallows, is more or less social and seems to enjoy associating not only with its own kind but also with man, who in most cases, I have found, recognizes the harmless qualities if not the beneficial attributes of this bird.

Ordinarily the barn swallow nests in colonies; rafters, beams and out-of-the-way corners in barns being the favorite nesting places. Whether the barn is used for stock or storage or is unused makes little difference. I have frequently found nests in abandoned houses in the region. The nest, which is open at the top, is habitually constructed of pellets of mud held together with grass and straw and lined with feathers. The four to six eggs are whitish, thickly spotted with brownish.

The following observations on the breeding and nesting of the barn swallow in this region are taken from my field notes and are here arranged chronologically.

"May 8, 1928. Lower South Bay district: Carrying nest material. West Monroe Cemetery district: mating.

"May 17, 1929. Vandercamp: F. C. Soule estate northwest of Cleveland: One nest completed, another just begun, the female working on it; in vacant cow stable.

"May 22, 1929. Shaw Point: Nests, completed and in process of construction; in outbuildings at Shaw farmhouse. No eggs.

"May 28, 1929. Cleveland: A bird carrying mud and sand from shore of Oneida Lake to the porch of an unoccupied cottage a short distance away, where a nest is under construction.

"June 10, 1929. Abandoned house in cut-over wooded district three miles north of Cleveland. A pair working on a nest, attached to a heavy fold of building paper swinging from the ceiling of an upper room in this house. Birds carrying in mud through the paneless windows. The paper was swinging in the breeze and seemed to be a precarious place on which to attach a nest, for it looked as though it could barely support its own weight to say nothing of the added burden of a mud nest and a family of young barn swallows. The nest was only well begun.

"June 16, 1928. North Bay: Old barn; nest with four eggs.

"June 27, 1928. Jewell: Examined two nests high in the gable of a barn. Young have evidently been reared in both, this season. A young bird flew from one of the nests as I prepared to ascend to it on a ladder. It seems that a second brood is reared here for one of the nests was in process of rehabilitation, fresh mud having been placed around its rim. For the second brood, new nests are sometimes constructed, though the old one may be restored for the purpose, as was the case here.

"June 27, 1929. Village of Clay: Several nests in coal shed along railroad tracks. Young had left.

"June 28, 1928. Vandercamp, F. C. Soule estate northwest of Cleveland: Nest containing three eggs and two very small young not more than thirty-six hours old; ten feet up under eaves of barn.

"July 3, 1929. W. Parker barn, one and one-half miles southwest of Lakeport: The bird is common here: Most of young out of nest now; found one nest attached to a rafter thirty-five feet from the ground; it contained five young birds, ready to leave within two or three days. These birds were banded (Nos. 46409B-46413B)."

From late June and throughout July young of the year and adults are to be seen in numbers perched on roadside telephone wires. As the season advances the adults first move into the outlying districts, leaving the more settled communities for a time to the young birds now well able to fly. At this season of the year such places as the Cicero Swamp south of Clay and other open grassy or flag-bearing marshes south of Lakeport and Bridgeport are the roosting places of thousands of these swallows.

The young birds that remain for a time in the more thickly settled districts often rest in groups of five to fifty or more on roadside telephone wires. Very often roadside groups consist not only of barn swallows but include also cliff, tree, and bank swallows. However, the last species seems less prone to mingle in this way. Often of mornings scores of barn swallows, sometimes accompanied by

other species, congregate on the roofs of barns and other buildings to take advantage of the sunshine and shelter afforded.

The food of the barn swallow consists almost wholly of animal matter of which insects make up by far the largest part. Practically all the food of this bird is taken on the wing. Its crepuscular tendencies are well shown in this connection for often toward dusk the bird feeds most actively. According to Beal's report (1918, pp. 12-14), beetles, some of which are beneficial, make up about sixteen per cent of the food of the barn swallow; true bugs, fifteen per cent; two-winged flies about forty per cent; and Hymenoptera,—among them some beneficial ones as well as bothersome flying ants—about thirteen per cent. Other insects of lesser importance include moths and butterflies, dragonflies and mayflies.

Locally the barn swallow, in company with other species of swallows, frequents the vicinity of Long and Wantry islands where, early in August, mayflies are particularly abundant on the tall grass and other vegetation that covers these islands at that season. Apparently some of the swallows roost there for, on August 8, 1928, as I approached Wantry Island in a boat early in the morning, several of these birds were resting on the tall grass. Now and then a bird flew over the island or around it, swooping down at intervals to feed on the mayflies clinging to the grass stalks. At times, as several birds rushed along close to the grass, scores of insects would be dislodged by the beating wings to fall easy prey to the courting swallows, as many as fifty to sixty of which could be counted. Similar conditions prevailed at Long Island. The click of the bills of the birds as they seized the mayflies was often plainly audible.

The barn swallow is a highly beneficial bird and in the Oneida Lake region it seems to be generally regarded with the favor that it deserves.

Upper parts deep steel-blue; under parts varying from pale buffy to deep chestnut; tail deeply forked, the feathers when spread showing a broken band of white. Female paler.

On July 13, 1928, at a point about one mile south of Shackelton Point, I saw an albino barn swallow. It was sitting on a wire fence at the roadside along with others, mostly young, of the species, all of which were normal in coloration, so that the light-colored individual stood out from them in sharp contrast. It was a bird of the year, well able to fly, but the deeply forked tail so characteristic of the adult was not yet in evidence. The bird was pale grayish on the wings and upper parts, blackish about the eyes, and under parts pure white. Of the thousands of barn swallows that I have seen here this is the only one that exhibited even a tendency toward albinism.

Northern Cliff Swallow. *Petrochelidon albifrons albifrons* (Rafinesque).

No doubt the encroachment of "civilization" upon natural conditions has had much to do with the depletion of the numbers of the northern cliff swallow throughout its summer range. Unfortunately for the bird it has largely forsaken as nesting sites the caves, caverns and cliffs of its forbears and has followed the advances of man; now it usually breeds about his country buildings

where its nest activities are often molested. As a consequence, in some localities the bird has become rare where it was formerly common. This seems to be true of many places in New York State, although in the Oneida Lake region this swallow is now a fairly common bird. Throughout the region as a whole I should say that it is surpassed in numbers by the barn and the tree swallow, and possibly by the bank swallow, but its abundance at certain local stations is really surprising and at some of them it even outnumbers the generally far more common barn swallow.

The first cliff swallows to arrive from the winter home in tropical America appear here late in April. They appear in numbers later and more gradually than the barn swallow, and not until about May 17 do they reach maximum local abundance. The major part of the fall movement occurs in September, beginning about the 10th.

Early spring arrivals in the Oneida Lake territory associate freely with barn, bank and tree swallows, but as the nesting season approaches, the distribution of the cliff swallow throughout the territory becomes remarkably localized despite the fact that its favorite nesting sites are generally plentiful. Later in the summer it is found distributed more generally throughout the territory. In general, there is no doubt that the cliff swallow is much commoner in the territory north of Oneida Lake than in the districts south of it. On the north side the North Bay, Jewell, Cleveland, Bernhard Bay and Constantia districts—contiguous territory—are the centers of summer abundance. It is evident that certain farms, even some of those south of Lakeport, are selected by large numbers of these birds almost to the exclusion of the barn swallow; on the other hand at a neighboring farmyard the barn swallows may hold the numerical advantage. This remarkable local preponderance, or comparative absence, is one of the most interesting ornithological features observed in this region.

While we noted the habitual dominance of the cliff swallow about the barns in the North Bay and Jewell districts, its sporadic abundance on the south side is well illustrated by a field note under date of July 5, 1929. "At the first farmyard east of the Wm. Parker residence southwest of Lakeport the cliff swallow is nesting in some numbers in the barn. No barn swallows about. However, at the Parker place itself the barn swallow and *not* the cliff swallow occurs. The barn swallow is common and widely distributed; the cliff swallow is less common, and 'spotted' so far as its distribution in the region is concerned."

In the Panther Lake district the cliff swallow is the commonest member of the family throughout the breeding season, when it may be seen frequently coursing over the waters of the lake and the open fields south of it, in company with barn and tree swallows.

On August 4, 1928, I was much impressed by the abundance of cliff swallows in the Oneida Valley district where, in the low open country, the birds had congregated and were feeding in numbers equalling those of the barn swallow anywhere in the region.

After the nesting season the cliff swallow in company with other swallows repairs to the outlying districts and marshes to feed and to roost, gradually

deserting the scenes of its nesting activities. This movement from the breeding territory is first evident on the part of the adults, even though they remain for some time in attendance on the young in the vicinity of the nesting places.

The note of the northern cliff swallow is a harsh chirp. Its flight lacks in some measure the grace of the barn swallow with which it most frequently associates. There is lacking also some of the belligerent qualities of that bird.

The well known jug- or gourd-shaped nests of the cliff swallow, closed save for a small exit, are composed of mud and lined with grass and feathers. The eaves of barns and other outbuildings are frequently chosen as the sites for the nests, of which as many as several dozen may at times be constructed side by side, under favorable conditions. In the region in question I have never seen more than ten or twelve so placed. Sadler (1926, p. 16) says she "Found thirty-eight nests under the eaves of one side of a barn near Panther Lake on June 30, 1925."

Some details of our findings regarding the nesting activities of the cliff swallow in the region may be of interest and these chronologically arranged excerpts from my field notes give some notion of the sequence of events during this important period.

"May 15, 1929. Lower South Bay to Cleveland via Brewerton: Cliff swallows obviously commoner on north side of lake than on the south side. Nests completed now.

"May 22, 1929. Cleveland to Shaw Point. Barn swallow first, cliff swallow next and tree swallow third in point of numbers; all three species occur at Shaw Point. Nests of barn and cliff swallows completed and some in process of construction at Mr. Shaw's barn and out-buildings.

"June 1, 1929. Abandoned barn two miles east of Cleveland: Only cliff swallows here. Mud nests under eaves, but no lining in nests and no eggs.

"June 8, 1928. Phillips Point district: Several nesting in barn here along with barn swallows.

"June 15, 1926. Constantia district: Examined a nest under eaves of a farmyard chicken house. An adult bird resting in it, but the nest was unlined and contained no eggs or young.

"June 16, 1928. North Bay district: Nest with four eggs, in an out-building. The mud nest was built around a large iron bolt that projected from a beam. This species seems to be as common as, if not commoner than, the barn swallow here.

"June 22, 1928. Shaw Point: Several nests have been constructed under eaves of Mr. Shaw's barn. Found some of them lined and ready for eggs; others were still unlined, and one nest contained eggs.

"July 11, 1929. Lakeport district: Commoner in some very restricted districts here than the barn swallow, but in general not so widely distributed; good many young of the year out now—the first I have seen this season.

"July 17, 1929. Cleveland district: Commoner on north side of Oneida Lake than on south side. Good many young on roadside telephone wires in vicinity of North Bay and Jewell.

"July 26, 1929. Cleveland and Bernhard Bay district. Adults and young sitting on roadside telephone wires with barn swallows and an occasional tree swallow. Feeding over lake at Bernhard Bay. More numerous on the north side of the lake. The birds sit almost motionless for long periods of time, or vigorously preen their plumage at intervals; perhaps they make a dash from the wire to feed or to bathe, but sitting seems to be the principal occupation of the young birds now. The adults often feed them where they sit.

"July 29, 1929. Cleveland, North Bay, Thompson Corners, Camden: Good many barn and cliff swallows on roadside telephone wires; mostly young birds; very few about barns now that the breeding season is over. Most are feeding in the vicinity of swamps and marshes where flying insects are more plentiful than on the high dry hills and open fields.

"August 1, 1928. Cleveland, Fish Creek Landing and North Bay: Few adults along roadsides now; for the most part only young of the year are seen; adults have now largely moved into the marshes and other outlying feeding places."

As is the case among the other members of the family, the food of the cliff swallow consists almost entirely of animal substance and of this, insects make up by far the greatest share. Among the insects, large numbers of beetles, ants and other Hymenoptera, true bugs and two-winged flies are taken; in addition, grasshoppers, mayflies, dragonflies, spiders and snails make up some part of the bird's diet.

Since all the swallows have relatively small and weak bills and since they feed almost entirely on the wing, small and easily swallowed insects must of necessity form the major portion of their diet. Most of the insects taken are injurious, so far as man is concerned, and therefore the activities of the cliff swallow are predominantly beneficial.

While I have observed little evidence of it in the Oneida Lake region, the practice of destroying the nests of this bird still persists in some parts of the country. It is a foolish, reprehensible practice that should be stopped. The popular belief that the cliff swallow and others harbor bed bugs on their bodies or in their nests is without foundation in fact.

Crown and back steel-blue; side of head and throat chestnut; forehead whitish; upper tail-coverts pale rufous. Belly white. Tail feathers nearly equal in length.

Purple Martin. *Progne subis subis* (Linnaeus).

The purple martin is a locally common summer resident in the region where it arrives from its Central and South American winter quarters fairly consistently between April 19 and 24. Several of the local residents concur in their statements concerning the regularity of the time of spring arrival of this popular bird. Not infrequently after the martins appear in April, a period of cold, damp weather sets in and they seem to disappear, to reappear under more favorable conditions a few days later. The well-known inability of the martin to withstand cold leads me to believe that more or less local movements, dependent upon weather conditions, occur among the species here at this season.

The autumnal migration is said (Eaton, 1914, p. 343) to occur usually after the 10th of August. However, by August 15, very few martins are to be found anywhere in the Oneida Lake region.

Sometimes "migratory waves" of these birds take place in the spring. For example, on May 11 and 12, 1929, a great influx of martins occurred in the Lower South Bay district, during which the species arrived at something like its summer status in point of numbers.

While this bird is found throughout the more thickly populated portions of the territory, particularly in communities immediately adjacent to the lake, the open districts all along the south shore are more attractive to it than are the smaller open areas on the north shore. The Lower South Bay district is one of the local strongholds of this bird.

It is probable that at one time this martin nested in holes in cliffs and possibly in hollow trees. But its wholesale adoption of man-made offerings in the way of nesting boxes has resulted in its desertion of its original abodes. It now prefers the vicinity of man's habitations, even such populous centers as towns, villages and large cities.

In the Lower South Bay district the martin is a common bird about the cottages near the lake, where numerous nesting boxes—some of them of very elaborate construction—have been erected for it (Fig. 201). This concentration of nesting boxes is doubtless wholly responsible for the large assemblage of the birds here. But at almost every country home throughout the region one or more nesting boxes are to be seen. Likewise Bridgeport, South Bay, North Bay, Jewell, Cleveland, Constantia and Brewerton all have a fair share of martins.

One of the most substantial and satisfactory martin-houses that I have seen here has been constructed by Mr. F. J. Becker at his home near Lower South Bay. This house has been erected on a pole about twenty feet high, in an open place sixty feet from his residence. Several compartments are available for the birds. The pole is so arranged that the house may be lowered for cleaning (Fig. 200). It is supported by two posts through which two iron pins have been inserted to hold it in an upright position. The upper pin may be removed, thus permitting the house to be lowered while the lower pin serves as a hinge (Fig. 199).

Other houses, some plain, some more or less elaborate, are to be seen all through the territory, and the birds have responded by occupying most of them. English sparrows build in many of them before the arrival of the martins and these pests have to be ousted in order to give the martins sole possession.

Immediately or shortly after their arrival the martins congregate about the nesting boxes where they sing and sun and preen themselves. From these points they disperse over the adjoining lakes, swamps and meadows in search of food. Their liquid warble is pleasing and their aerial gymnastics arouse one's admiration. Frequently the birds are observed high in the air above the woodland or lake where they are evidently pursuing insects; or again they skim along above the surface of the water, at times diving into it, in their quest for food. I have often seen numbers of the birds circling about over the heavily wooded areas

north of Cleveland. It is also a matter of interest that these birds inhabit in numbers the houses erected for them on the Soule estate in the heart of a heavily wooded and more or less isolated district.

Sometimes the martins alight on the ground to feed and a few times I have observed them feeding in the highway. While they seem to prefer to rest on roadside telephone wires and the roofs of buildings, I have often seen them perching in trees.

The nest is composed of sticks, straws and feathers; the eggs are white and number four or five.

Mating occurs throughout May, and during the latter part of that month nesting is begun, the greatest industry being displayed around June 1. About June 24, hatching had begun in Mr. Becker's martin-houses and a week later was nearly completed.

By mid-July many young, not long out of the nest and still attended by the adults, are to be seen about nesting boxes and on roadside telephone wires. For a time they remain at or in the immediate vicinity of the place of their birth, resting and preening themselves and depending mostly on food brought to them by the parents, for at this stage they hawk very little on their own account. However, in time they leave the boxes early in the morning, returning to them late in the afternoon, after having spent the day elsewhere in feeding. At first the parents return with the young, but gradually cease.

At several places in the Lower South Bay district young were in the nest as late as July 23, 1928; and as late as August 6, 1929, a family of young was still in a nesting box in the village of Cleveland. It seems therefore that occasionally two broods are reared here in a season.

Not only are these birds gregarious and colonial, but they also exhibit communal tendencies. For example, on July 22, 1929, at Cleveland I saw, within a space of a few minutes, at least three different adults feed the young in a single compartment nesting box.

Mayflies, which are so abundant about the lake from early July throughout most of the summer, form a considerable item of food of the young martins. The parents can be seen daily bringing quantities of these insects to the nesting boxes.

As the season advances the martins wander more widely, flying about the swamps and woods, and even crossing Oneida Lake. Several times on Long and Wantray islands I observed martins in flight across this lake. Once, on July 9, 1929, at about 7:30 P.M., while making an inspection of Long Island, I saw a martin stop long enough on its journey across the lake to pursue a common tern which, pugnacious as it is, gave way before the sallies of the belligerent martin.

At about 8:00 P.M. on June 19, 1929, a flock of eleven martins flew past Wantray Island on its way from the north to the south side of the lake. The birds did not stop at the island and were not feeding. Evidently some local movement of individuals takes place between the north and south sides of the lake. The extent to which this occurs might well constitute a little problem for future study. The banding method would prove to be helpful in such studies.

Evidence of flocking is to be seen in the Cleveland, Bernhard Bay and other districts early in August, when the birds, mostly young of the year, congregate on roadside telephone wires in company with other swallows. Evidently the adults wander farther into the swamps and wooded sections at this time, for comparatively few of them are to be seen; and as the month progresses the numbers of young that return nightly to the nesting places become gradually smaller.

The purple martin is one of the most purely insectivorous of all birds. Beal's investigations (1918, pp. 3-6) show that its food consists entirely of animal matter of which insects make up by far the largest share. A few spiders and sowbugs are occasionally taken.

Among the insects, ants and other Hymenoptera comprise twenty-three per cent; Diptera, a little more than sixteen per cent; Hemiptera, about fifteen per cent; Odonata, fifteen per cent; Coleoptera, about thirteen per cent and Lepidoptera about ten per cent. Mayflies (Ephemera) make up the bulk of the remaining items of diet.

While comparatively little of the purple martin's fare is directly beneficial to man, the Hymenoptera taken by it must be considered in part, at least, on the debit side of the bird's food column. For while troublesome ants make up part of this lot, parasitic, predacious, and plant pollenizing forms of the group also constitute an appreciable array. In addition, some of the beetles and flies taken are predacious forms and valuable from the viewpoint of man. However, all in all, the purple martin renders valuable service and well deserves the protection and encouragement that have been accorded it.

This is our largest representative of the family. Tail slightly forked. Male shining steel-blue; wings and tail dark brown. Female similar but brownish above and under parts brownish gray.

CROWS, JAYS, ETC.: FAMILY CORVIDAE.

Northern Blue Jay. *Cyanocitta cristata cristata* (Linnaeus).

This bold and noisy tyrant of the woods is generally distributed all through the Oneida Lake region, but it is not common. At one time or another I have seen or heard the blue jay in almost every wooded field station that I have visited, but it is more frequently seen in the denser and more extensive mixed woods north of Constantia, Cleveland and Jewell than in the isolated wooded tracts in the Lower South Bay, Froher Bay, Lakeport, Bridgeport or Sylvan Beach districts. However, I have encountered it sparingly at the latter places.

By way of indicating something of the infrequency of occurrence of this jay on the south side of the lake I may say that my field notes make no mention of it between June 24, 1929, when it was recorded in the woods south of Black Creek, about four miles south of Lakeport, and July 18, when I next recorded it from the Delahunt woods on the north side of the lake; this record stands despite the fact that almost daily trips were made to field stations on the south side of Oneida Lake. The corresponding period of the preceding season was spent on the north side of the lake and during this time the species

was recorded on several occasions. The west side of Big Bay Swamp and Emmons' woods near-by, have proved very favorable places for finding this bird, and so has Cicero Swamp, south of Lower South Bay. Early in the season the hardwoods in the Hitchcock Point district are a favorite resort of the blue jay.

Although as Eaton (1914, p. 208) suggests, the blue jay can be found in almost any part of the State at any time of year, more or less of a spring and fall movement of the species can be discerned. The spring migration in the Oneida Lake area is well marked. In the early part of May very few individuals are to be found anywhere. As the season advances the birds become more plentiful but not until late in the month do they attain their maximum of abundance. The numbers then fall off as the more northerly nesting birds move out, leaving the local breeding individuals to nest, usually from late April through May. The autumnal migration is said to occur from late September through October, although of course some birds are likely to be found in the region all winter.

About Oneida Lake the blue jay is most frequently found in mixed woodland, especially if it contains a sprinkling of white pine such as found in some parts of the Widrig and Vandercamp woods, where the bird is perhaps commoner than elsewhere. Somewhat the same conditions exist in the West Monroe Cemetery district where the species also is present in some numbers. Low and semi-swampy conditions seem to have strong attraction for it.

The platform-like stick nest of the blue jay is usually placed close to the trunk of an evergreen tree growing in dense woodland. The four to six eggs are laid late in April or early in May.

In some respects the northern blue jay is an exceedingly versatile and accomplished vocalist. Most persons, perhaps, do not know its low, soft warble, which I have usually heard when the bird seems contented and is undisturbed. Its common call—a shrill, high-pitched "*jay, jay*"—is known to every one. This note has remarkable carrying powers and can be heard for a long distance. The bird is high-strung, nervous, noisy and belligerent. Any unusual occurrence in its woodland home is sufficient to bring a number of its kin together at the utterance of the first excited "*jay*" cry. The notes of the red-shouldered and other hawks are successfully imitated by the blue jay, and I have heard it imitate the robin and other songsters with some fidelity.

Often the woods ring with the combined outbursts of several individuals harassing a hawk or owl. The loud cries, sallies, and thrusts with their powerful bills doubtless make life anything but enjoyable for these victims.

In flight the jay maintains a level and direct course over comparatively short distances from tree to tree or from one wooded tract to another. Ordinarily it does not fly at a great height.

The blue jay is omnivorous. On the one hand it consumes large amounts of woodland mast among which are acorns, beechnuts and chestnuts. In this respect it performs a service to man for in transporting and storing more acorns than it eats some find lodgment and grow into new trees. Other vegetable matter consists of wild fruits such as mulberries, sumac berries, blackberries, blueberries, and grapes, which are taken in abundance. On the other hand is its



Fig. 213. Gordon Pond showing decaying stumps in which eastern bluebirds and tree swallows nest. May 31, 1929.



Fig. 214. Gordon Pond and hemlock woods surrounding it. May 31, 1929.



Fig. 215. Captive immature eastern crow. June 15, 1928.



Fig. 216. Blind erected in corn field from which eastern crows were shot as they pulled up the newly sprouted corn. Muskrat Bay district. June 1, 1928.

animal diet, consisting of large numbers of insects such as beetles, grasshoppers, moths and butterflies and Hymenoptera. Many of these insects are either wood-borers or leaf-feeders and are injurious so far as man is concerned. With respect to the food just mentioned, the blue jay is a highly desirable bird citizen. On the other side of the ledger appears its undesirable habit of feeding upon the eggs and young of other, usually smaller, birds. However, as McAtee (1926, p. 50) suggests, probably "nest robbing is more of an individual or local, rather than general trait. The best remedy in such cases is to eliminate the offending individuals, not to wage warfare on the race."

Despite the many shades of blue mingled with black and white that go to make up the complete coloration of the blue jay, to my eye these shades are so harmoniously blended as to give a satisfying and pleasing effect, enhanced not a little by the conspicuous erectile crest.

Eastern Crow. *Corvus brachyrhynchos brachyrhynchos* Brehm.

While the crow breeds in every county in New York State, it withdraws from the colder districts in winter to the more equable southerly counties where it congregates in roosts numbering thousands of birds. Eaton (1914, p. 215) estimated that between 20,000 and 40,000 birds were assembled in the Gates crow roost near the city of Rochester.

In the Oneida Lake region the eastern crow is a permanent resident probably commoner in summer than at any other season, and breeds freely in the woodlands throughout the section. It occurs in the wooded districts north of Oneida Lake as well as in the agricultural areas south of it. It is general in distribution but retires to the wooded tracts to nest and roost. Its excursions to the cultivated fields and the lake shore for food also are well marked.

The general characteristics, activities, feeding habits and economic relations of the crow are so well known and so much has been written about them that I shall confine my statements very largely to an account of my own observations of the bird in this territory.

The crow is a more or less gregarious bird. While its flocking habit is conspicuous during the colder season, its social tendency is exhibited in a degree at the nesting period, when several pairs of breeding birds may occupy a limited area of woodland; and to a greater degree during the post-breeding period when they gather in favorite places to feed. Even previous to the nesting season the tendency to associate together is to be noted. The gregarious habit is of considerable interest from the viewpoint of the economic status of the bird.

The belligerent, quarrelsome nature of crows is familiar. They frequently unite their efforts in attacking and harassing some luckless hawk or owl that may have caught their attention. On June 7, 1928, in the heavy maple woods just west of the mouth of Chittenango Creek, I came upon a dozen or fifteen crows making life miserable for a great horned owl. The crows made a terrific din with their loud, harsh "caw," as they pecked and tormented their victim, giving it not a moment's peace. The owl flew from tree to tree and the crows followed it, until their cries were lost in the distant depths of the forest.

On another occasion, July 28, 1928, I watched several crows and blue jays tormenting an adult bald eagle in the woods near Jewell. The eagle accepted its trials with greater equanimity than did the great horned owl and appeared not to be particularly disconcerted by the attacks. On July 23, 1929, at the Vandercamp woods, I witnessed a similar attack upon a bald eagle, and at the Parker woods on July 1, 1929, I found several crows harassing a red-shouldered hawk.

However, the battle does not always favor the crow for it, too, has its smaller enemies in the red-winged blackbird and the kingbird, both of which are just as agile and belligerent as the crow. It is frequently subject to their attacks here as it flaps its way slowly over the Cicero or Big Bay swamps. The smaller birds swoop down from above upon the lumbering crow and their united attacks frequently drive it to cover.

While mating may occur late in March,—Sadler (1926, p. 12) records a pair nesting in Thornden Park, Syracuse, on April 1, 1912—the average date for eggs here is probably from about April 10 to 30. By May 1, many of the nests contain young.

The bulky, deeply cupped nests are usually placed in the fork of a tall tree, deciduous or evergreen, at a height of twenty to fifty feet above the ground. Most nests that I have seen here have been placed near the main trunk, not far out on the branches. Sticks, twigs and bark comprise the bulk of the nest materials. Little frequented mixed or deciduous woodlands or isolated wooded tracts are often chosen as nesting sites. Sometimes several pairs will nest in one small tract. The usual complement of eggs varies from three to five; they are bluish or olive-green, with heavy blotches of brownish. Both the ground color and the markings are subject to considerable variation. The incubation period is about eighteen days. The young are blind and naked and require about three weeks of care in the nest.

Of course we have come across many unoccupied nests in this territory. As a matter of local interest and in an attempt to indicate some of the principal breeding areas, the following places, in which we have found nests, may be mentioned: Mixed woods at William Parker farm one and one-half miles southwest of Lakeport; isolated woodlot in Shackelton Point district; hemlock tree, mixed woods, Billington Bay district; hemlock tree, Short Point district; white pine trees, Phillips Point district; boggy wooded tract about two miles southwest of village of West Monroe; white pine tree, mixed woods, F. C. Soule estate; several nests, tall maples, Potter Bay district one-half mile west of Cleveland; several nests in pitch and white pines in woods one mile east of Verona Beach.

The more specific data on the nesting of the crow in the region may be set forth in chronological order by months.

"May 4, 1929. A young man in the Lower South Bay district tells me that three or four days ago he climbed to a crow's nest in a large maple in the Van Antwerp woods and found eggs about ready to hatch. Several other nests in the woods here and in the more extensive mixed woods a little farther west.

"May 7, 1929. Several nests with young in the maples and hemlocks southwest of the Syracuse Yacht and Country Club golf links. The adults were carrying food and became much disturbed at my presence.

"May 9, 1929. Nest in maple woods, Hall Island district. Saw one adult carrying food.

"May 10, 1929. Van Antwerp woods. Saw an adult bird carrying what appeared to be nesting material. This seems to be a late date for nest building.

"May 20, 1929. In a dense and little frequented hemlock-maple woods two and one-half miles northeast of Cleveland I found a nest containing two young about ten days old. This nest was thirty-five feet up in a white pine a foot in diameter at the base. The pine was one of a group at the edge of the heavier woods; bark and twigs made up the bulk of the nest, which was well rounded and compact. Its interior was white with the excrement of the birds, as though it had been whitewashed; but there were no masses of excrement or evidence of moisture in the nest.

"June 15, 1928. Crows are common and nesting in the woods north of Bernhard Bay. Discovered a young bird that had been out of the nest for perhaps a week. It had a broken wing.

"June 15, 1929. A nest found to-day in the Van Antwerp woods, thirty feet up in a tall slender hemlock, contained two half-grown young."

It is evident that the breeding season extends over a considerable period of time and, although but a single brood of young is reared in a season, nests with young birds are common here from May 1 to June 10 or thereabouts.

In July and August, after the young have left the nest, small loose flocks of six to ten birds visit the cut-over hay fields where they apparently feed on insects. No doubt the very abundant grasshoppers and crickets make up a considerable portion of their food. At this period, too, the beach drift along the shores of Oneida Lake is eagerly scanned by the crows for whatever food it may contain. Usually a group of several birds will work in loose formation along a beach expanse, with one or more lookouts posted on the top of some tall tree near-by (Fig. 139). If alarmed the lookout in the tree utters a loud warning "*caw*" and the entire group immediately takes wing. Many times at Verona Beach, Froher Bay and similar situations I have had opportunities to observe this characteristic.

In late June, 1929, at the Wright woods in the Lower South Bay district I came upon several crows resting on the ground under the tall hemlocks, but with a lookout posted in a tree above them. As I approached, the latter gave a warning call and all flew away at once. No doubt this habit is an important survival factor in the life of these wary, intelligent birds.

The economic status of the crow has been the subject of much controversy, but the exhaustive studies of Mr. E. R. Kalmbach of the U. S. Biological Survey (1918) have served to settle most of the mooted points in regard to the food habits of the bird. After examining 2,118 stomachs of both adult and young crows taken at various seasons of the year in thirty-nine States, the District of Columbia and several Canadian provinces, and after reviewing the information

furnished by replies to more than 3,000 letters of inquiry sent out, Mr. Kalmbach concludes his report as follows (*loc. cit.*, pp. 85-86):

"When feeding on injurious insects, crustaceans, rodents, and carrion, and when dispersing seeds of beneficial plants, the crow is working largely for the best interests of man; when destroying small reptiles, amphibians, wild birds, poultry, corn, and some other crops, when molesting live stock and distributing their diseases, and when spreading seeds of noxious plants, the bird is one of the farmer's enemies; when destroying spiders and mollusks, however, its work appears in the main to have a neutral effect. The misdeeds of which the crow has been convicted greatly outnumber its virtues, but these are not necessarily equal in importance. Much of its damage to crops and poultry can be prevented, while the bird's services in the control of insect pests can ill be spared. At the same time no policy can be recommended which would allow the crow to become so numerous that its shortcomings would be greatly accentuated. As the capabilities of the crow for both good and harm are great, it is believed that an extermination of the species would have ultimate consequences no less serious than an overabundance.

". . . It may be said that the laws relating to it, at present in force in most States, are altogether satisfactory. It is well that no protection be afforded the bird and that permission be granted for shooting it when it is actually found doing damage.

"Bounties can not be recommended, neither can a campaign of wholesale destruction where complete extermination is the object sought. However, a reasonable reduction of numbers is justifiable in areas where there is an overabundance of the birds. The attitude of the individual farmer toward the crow should be one of toleration when no serious losses are suffered, rather than one of uncompromising antagonism resulting in the unwarranted destruction of these birds which at times are most valuable aids to man."

The above succinct statement sets forth in a general way not only the food habits of this omnivorous bird, but also suggests a program of caution in attempting to establish more than local control measures. It will be sufficient to add that Kalmbach's investigation showed that about twenty-eight per cent of the yearly diet of adult crows is made up of animal matter, of which, in turn, insects comprise about twenty per cent. Vegetable material constitutes about seventy-two per cent of the adult crow's yearly diet, and of this more than fifty per cent is corn, while wild fruits constitute fourteen per cent; other cultivated grains and crops make up the remainder.

In the Oneida Lake region as in most other places corn is the crop most affected by crows, and various devices are constructed and methods practised in an attempt to keep the birds from the fields in June and early July. While the farmers of the region are unanimous in their declarations that the crow destroys corn, conflicting opinions are expressed as to the actual or proportional amount of damage really caused by it.

Mr. Taft, a farmer in the Bernhard Bay district, says that crows do considerable damage to corn, more than is done by the bronzed grackle. Another farmer stated that the grackles destroy more corn than the crows. A farmer

in the Hitchcock Point district said that crows not only pulled up newly sprouting corn, but also recently set cabbage plants, and that he has suffered damage from the bird on both counts.

While the exact amount of damage is hardly possible to compute, and varies much, the fact that the farmers' crops suffer more or less from the crow can not be doubted. One of the means commonly employed to keep the crows from the fields is to place scarecrows of diverse kinds at various points. Throughout June in the corn fields in the territory may therefore be seen many human effigies of various sizes, designs, colors, grotesque postures and conditions of service (Figs. 218 and 219). It seems to be generally agreed among the farmers that the scarecrows are sufficient for a time in keeping the birds away, but that after a few days the crows disregard them. If some part of the scarecrow is made to move in the breeze, the results are better.

A farmer near Cicero Center told me that neither scarecrows nor coal tar preparations used as deterrents are effective in keeping the crows away. He was then (June 21, 1929) employing both methods in an attempt to save some part of his corn crop, of which more than one-half, he said, had already been lost to the crows.

On June 16, 1928, at the James Mulholland farm a mile north of the village of North Bay, I found a device in use in a small field of corn which on this date was about two inches high. A series of heavy cords resting at intervals on sticks had been strung around and through the field. Attached to the cords at varying distances were white and yellow cloths of some size which flapped gayly in the stiff breeze (Fig. 217). I was told by the owner of the field that this was an effective way of discouraging these crows. Almost at the same moment that my informant was speaking, I saw four crows feeding in this very field, and a moment later a fifth bird flew up from it! Apparently the device was not perfect.

Owing to the extreme wariness of the crow, the use of firearms in reducing its numbers is not very effective. However, simply the intermittent shooting of a gun in the vicinity of a corn field is sometimes an effective method to keep the crows away. Frequently the carcass of a dead crow is tied to a cord and left to dangle in the breeze. Blinds in the form of tents (Fig. 216) or similar structures in which a gunner may hide are occasionally erected in corn fields, but the birds are so wary that after a few shots they seldom come within range.

In addition to the damage to corn, destruction of nestlings of other species and attacks on young poultry by crows are reported in the territory.

Here, as elsewhere, the crow is a factor for both good and evil. The employment of control measures is frequently advisable. A wholesale and widespread slaughter of the bird is scarcely warranted, for commercial damage is usually more or less local and seasonal. Local treatment of the situation usually solves the difficulties.

TITMICE: FAMILY PARIDAE

Black-capped Chickadee. *Penthestes atricapillus atricapillus* (Linnaeus).

No more confiding and inquisitive little bird occurs in the region than the chickadee. It is a permanent resident, fairly well distributed but most abundant in the wooded sections.



Fig. 217. Large cloths suspended on wires stretched above and around this corn field have been employed as a frightening device to keep away eastern crows. North Bay district. June 16, 1928.



Fig. 218. Scarecrow at edge of corn field, Maple Bay district. June 2, 1928.



Fig. 219. Scarecrow in corn field near Hitchcock point. June 22, 1929.

While the chickadee can scarcely be called a common bird here, it outranks numerically both the white-breasted nuthatch and the brown creeper, two other arboreal species found often in the same situations. The more heavily wooded areas appeal to the chickadee and I have found it to be most common in such districts as Gordon Pond, Hitchcock Point, Sauers' Woods near Cleveland, Louis Will Game Retreat, North Bay, Sylvan Beach and the Cicero Swamp south of Bridgeport. It is partial to hemlock-maple woods in particular in this area. During the summer it is noticeably more plentiful in the north-side wooded sections than anywhere on the immediate south side of the lake, but it breeds in both places. After the breeding season it spreads into the adjacent open country and cultivated areas. This movement is apparent toward the end of July.

The chickadee has a restless disposition. Its acrobatic habits are well known. Often it may be seen hanging head downward while feeding on a swaying branch. Its flight from tree to tree is quick and jerky, accompanied by a "pumping" of the tail.

The social habits of the bird are usually evident except during the breeding season. Every woods trampler is familiar with these fluffy little birds that often follow him with their friendly twitter, and can be induced to come quite close by imitating their notes. At the Delahunt sand pit, June 23, 1928, just northeast of Cleveland, I called six of these birds to within ten feet of me, all at the same time. Some of these evidently were birds of the year for their plumage was a little streaked, especially on the under parts. I think the species breeds in the aspen and pin cherry thickets where here and there an old stub of a tree occurs, offering nesting places. Earlier in the morning I enticed two or three inquisitive individuals to me by loudly and rapidly kissing the back of my hand. The chickadee, the redstart and the oven-bird seem to be particularly responsive to this sound.

On July 12, chickadees were abundant in the maple-hemlock woods north of Sylvan Beach. They kept well to the tops of the hemlocks where they appeared to be feeding on the fruit of these trees. At frequent intervals they uttered the familiar "*phe-bee*" note and intermittently indulged in a low, squeaky, lisping song. Later in the summer this tendency to associate in loose groups becomes more apparent. In such places as the hemlock woods on the F. C. Soule estate, the Widrig, Van Antwerp, Emmons and other wooded tracts such gatherings were repeatedly noted.

The well known and characteristic "*chickadee-dee-dee*" note is uttered all through the year. Another and less familiar note, a drawn-out whistled "*phe-bee*," is sometimes mistaken by the uninitiated for the call of the wood pewee. The two calls are readily distinguishable, however, for that of the pewee bird is composed of *three* syllables and is more plaintive in quality. Some writers state that the "*phe-bee*" note of the chickadee is given only in spring, but my observations are that it may be uttered at almost any season. In the Oneida Lake region I have heard it as frequently in August as in May. Still another call is often heard; it is a lower series of notes of a warbling quality and has been written "*tickleweetletoo*." (Saunders, 1923, p. 292.)

That the black-capped chickadee nests commonly in the region can not be doubted, although I have not actually found a nest with an incubating individual. I have, however, in many places found what were doubtless the nesting cavities of the bird. In dead hemlock trees in the Fish Creek district, dead tree stubs in the Panther Lake district, birch saplings in the Delahunt woods, in larger decaying birch trees in the North Bay district and in dead hemlock stubs in the Widrig woods northeast of Cleveland, as well as in other places about the lake, I have found unmistakable evidences of nesting.

Sometimes chickadees excavate their own nesting holes in the stubs of dead trees, a pile of fresh chips about the foot of the tree affording mute evidence of their activities. The round entrance hole is about one inch in diameter and may be anywhere from three or four to twenty feet above the ground. The nesting cavity is usually six or eight inches deep. At times the birds occupy old nesting holes of woodpeckers, in trees or in fence posts. Soft grasses, moss, plant down and feathers are the nesting materials. The usual clutch of five to eight white eggs, spotted with reddish brown, is likely to be deposited sometime between mid-May and mid-June.

"About three-tenths of the food of the Chickadee is vegetable, and seven-tenths animal. Mast and wild fruits supply the bulk of the vegetable food. The mast is derived chiefly from coniferous trees, and the favorite wild fruits are the wax-covered berries of bayberry and poison ivy. A good many blueberries also are eaten, but only limited numbers of other wild fruits and seeds.

"The important things in the animal food of the Chickadee, in order, are caterpillars and eggs of lepidoptera, spiders, beetles, true bugs of various kinds, and ants, sawflies, and other hymenoptera." (McAtee, 1926, p. 86.)

Beneficial alike to the orchardist and the forester, unsuspicious and non-belligerent, energetic, and pleasing both in voice and appearance, this hardy little bird is deservedly a general favorite. In winter it responds readily to food that is placed at feeding stations and this habit has further endeared it to the general public.

The ashy gray upper parts, black crown, nape and throat, white under parts with sides and flanks tinged with buffy are distinguishing features. The sexes are similarly colored.

NUTHATCHES: FAMILY SITTIDAE

White-breasted Nuthatch. *Sitta carolinensis carolinensis* Latham.

A permanent resident in the Oneida Lake region. During the summer at least one can always be sure of hearing or seeing several individuals in the course of a half-day among the orchards or wooded sections of the region. It is not often seen in the dense hemlock woods on the north side of the lake, or at some points on the south side.

The localities in which the white-breasted nuthatch has been seen most frequently include the Cleveland, Oak Orchard, Verona Beach and Short Point districts, as well as the Parker and other more or less undisturbed and sizable wooded areas south of Bridgeport and Lakeport. In the Oak Orchard district and the area adjoining it to the north and west of the Oneida River as well as in

limited areas four miles south of Lakeport, the large numbers of dead chestnut trees offer particularly favorable nesting sites for this nuthatch, and here I have found it more common than elsewhere.

The climbing ability of this bird is well known. It keeps well to the trunks and larger limbs, climbing up, down or around them with equal facility. In this activity the body is not supported by the tail as is the case in such other climbers as the woodpeckers and the brown creeper.

During its vagrant clamberings, the nuthatch utters a nasal "*quank, quank*" as it searches the bark for larvae or insect eggs. At times in the spring or after the breeding season, several birds may be found in close proximity among the trees, and their notes as they seem to answer one another at frequent intervals constitute a rather unusual chorus. Two or three times here I have noted such vocal exhibitions. While the bird has no song, in spring it frequently gives voice to a series of low, but high-pitched, whistled notes which have been written, "*hah-hah-hah-hah-hah.*"

The white-breasted nuthatch nests early in the season—late May and early June. Its nest of leaves, grass and moss, with a lining of feathers, is placed in a hollow stump or tree, often in an abandoned woodpecker's hole. The five to eight creamy white eggs are finely speckled with reddish brown.

Although I have not found a nest of this nuthatch in the territory I have a considerable amount of circumstantial evidence—such as the occurrence of young birds in certain districts late in June and early in July—that the species breeds here. A field note under date of July 9, 1928, sets forth some of this evidence: "In the woods about one and one-half miles north of Schroepel's Bridge, in the vicinity of Oak Orchard, I saw several white-breasted nuthatches to-day including birds of the year. The profusion of dead chestnut trees here should afford excellent breeding and feeding grounds."

The immediate region is not thickly settled and the forested areas not much disturbed except during winter, when some cutting of chestnut and other timber is done. Areas of dead chestnuts occur also south of Bridgeport and Lakeport. In late July, too, young of the year were seen in the village of Cleveland.

After the middle of July the white-breast seems to move out of its more restricted breeding retreats in the wooded sections to the open territory about villages and farmhouses, for its presence becomes continuously more apparent as the summer season wanes. Both young of the year and adults take part in this movement, evidence of which I have noted particularly in the Cleveland, North Bay, Sylvan Beach and Constantia districts.

While the white-breasted nuthatch is fond of mast—beechnuts, acorns, hickory nuts and the like—especially in winter, the amount of animal food consumed through the spring and summer months is considerable. Beetles, caterpillars, bugs, ants, flies, grasshoppers, moths and spiders are taken freely. Some of these insects are injurious to forest and shade trees, so whatever is done by this bird toward a reduction of their numbers stands in its favor.

The bluish gray upper parts, white under parts and black top of head and neck, together with its squat appearance and arboreal habits distinguish this bird. The female is similar to but of duller plumage than the male.

Red-breasted Nuthatch. *Sitta canadensis* Linnaeus.

Only once during the season of 1928 did I see this little nuthatch. On May 18, a single male was noted in a maple tree growing on the low flat near the shore of Oneida Lake, at the west side of the mouth of Chittenango Creek. Three records of its occurrence here are included in my 1929 notes: May 6, Nicholson Point; a red-breasted nuthatch on a sloping trunk of a dying willow near the lake shore; a downy woodpecker on the same trunk was tormenting the nuthatch by creeping along the tree trunk and pecking at it. May 21, Baker Point near Constantia; one seen in a maple-elm swamp. June 4, one seen in deep hemlock-maple-birch woods three miles north of Cleveland.

From these four records obtained in two seasons' work we conclude that the red-breasted nuthatch is a rather rare migrant in the Oneida Lake region. But irregularity in appearance and local numbers is probably to be expected here. The late May and early June records of its occurrence lead me to suspect that the species may breed in suitable localities. Sadler (1926, p. 19) says, "It is occasionally seen during the winter."

Ralph and Bagg (1890, p. 232) state that this is "A common migrant; summer resident in the northern part of the County [Oneida]. Breeds. A second nest taken May 30, 1887, in Wilmurt, Herkimer Co., contained six fresh eggs."

Over most of New York State the bird is a fairly common migrant of more or less regular occurrence and abundance. Its spring movement usually takes place between March 15 and May 15. It sometimes winters in suitable localities and is reported as an abundant summer resident in the coniferous forests of the Adirondacks and Catskills above 2,000 to 3,000 feet. Ordinarily this nuthatch breeds in the Canadian zone, but it would not be surprising if it nests occasionally in certain localities on the north side of Oneida Lake, which resemble closely in everything except altitude the typical breeding conditions in the Adirondack mountains 100 miles away.

"It is very fond of the seeds of pines, spruces, and the like, which it takes in lieu of the larger mast favored by the white-breast. The animal food is known to include beetles, hymenoptera, and spiders, and among forest pests it has been observed to feed on the ribbed pine borer (*Rhagium lineatum*)."

(McAtee, 1926, p. 85.)

The red-breasted nuthatch resembles in form and habits the more common white-breasted nuthatch from which it may be distinguished by its smaller size, black face-stripe, reddish brown under parts and finer, higher, more nasal and less vigorous note, "yna-yna-yna."

CREEPERS: FAMILY CETHIIDAE

Brown Creeper. *Certhia familiaris americana* Bonaparte.

This busy little woodland bird has been observed on numerous occasions at various field stations in the Oneida Lake region, throughout the month of May. Lower South Bay, Maple Bay, Hitchcock Point, Louis Will Game Retreat and Breeding Ground, Shackelton Point district, Verona Beach and Cicero Swamp three miles south of Lower South Bay are typical localities.

During May, 1929 season, when the brown creeper was unusually common in several districts on the south side of Oneida Lake, I often came upon small groups of three to six individuals in the woods, all within a few yards of one another. Perhaps not another individual would be seen for an hour or even during the entire morning. This apparent concentration of birds within localized areas led me to believe that a more or less concerted movement was taking place and that the species traveled in loose groups, not close enough to be termed flocks.

During June, 1928, I did not see this species, but in the 1929 season I discovered a pair in the deep hemlock woods three miles northwest of Cleveland. I then suspected that the brown creeper might be breeding in the district, for migrant individuals should then have been gone and it was still too early for those that nested farther north to have returned. On June 13 this suspicion was verified when I saw, in more or less open, tall maple-elm woods on low, boggy ground a half-mile south of the mouth of Chittenango Creek, an adult carrying food. After a short period of watching I discovered the nest, which contained six young about ready to leave. The nest was about three and one-half feet from the ground, under the loose bark of a dead chestnut tree two feet in diameter. It was wedged in between the bark and the trunk of the tree; small twigs and sticks, some of them three inches in length and of a size that one might think impossible for so small a bird to carry and manipulate, comprised the bulk of the nest. In addition, pieces of the inner bark of the chestnut, and small twigs and catkins of willow were included in the nest materials. The structure had a scant lining of down from the catkins. Below the nest, the bark clung firmly to the tree, but above, it bulged out so that it formed a canopy for the nest beneath which the young birds might have taken their first lessons in climbing.

As I stood viewing the situation in general and the young birds in particular four of them climbed into this covered space and, as I attempted to capture them, made a short flight into the surrounding vegetation. A little later I saw an adult feeding one of the youngsters clinging to the side of a tree. The young one did fairly well in its first attempts at climbing in the open, but seemed to have some difficulty in clinging to the smooth bark of the maples and moved about on these trees until it came to a little ledge of bark where it appeared more comfortable. This and the other young were attended by the parents at frequent intervals. Once I saw the young receive a grayish moth and at another time what appeared to be either a mayfly or a stonefly. I captured two of the young and returned them to the nest wearing bands Nos. 46403B and 46404B, respectively.

My July records for the brown creeper are very few and I have not seen the species here at all during August. Its absence in the Oneida Lake region is certainly not complete for I feel sure that at least some individuals occur in suitable habitats. I think this apparent absence is due to several factors, among which are its quiet, retiring habits, somber colors, weak song and the lesser activity at this season when a portion of its time is taken up by the phenomenon of the molt.

Over most of New York State the brown creeper occurs as a transient, but a few remain all winter. The northward movement is most marked during April and May. It is reported as a common summer resident of the mixed woods in the western Adirondacks in June and July. It breeds also in the upper Catskills. Its occurrence as a summer resident in other parts of the State seems to be purely local. The species has been reported as nesting in Madison, Oneida and Onondaga counties, but so far as I am aware, at points some fifteen or more miles from Oneida Lake. My nesting record indicates that it breeds also in the immediate vicinity of this lake.

The brown creeper can be distinguished from our other small tree-climbing species by its wood-brown coloration, slender curved bill and long pointed tail feathers which are appressed closely against the side of the tree for support. In addition, its habit of alighting at the base of a tree and of working upward in a spiral course, then in a broad sweeping flight moving to the base of another tree near at hand to renew the performance is diagnostic. It is tame and unsuspicious and will often permit a close approach. Its sharp "*tseet, tseet, tseet*" is perhaps more frequently heard than its author is seen. In its summer home the brown creeper is said to have a low but pleasing song "much like that of the black and white warbler,—a chattering expression of content distinctly different from any other song heard in the open woodland association." (Silloway, 1923, p. 444.)

In food habits the brown creeper is highly insectivorous. It gleans from the bark of trees such forms as weevils, leaf beetles, flat-bugs, plant lice, leaf hoppers, scale insects, small Hymenoptera, moths and spiders. In addition, the eggs, larvae and pupae of many kinds of insects are taken. Most of the insects taken are highly destructive; and many of them and their eggs, and immature stages as well, are so small as to be overlooked by the majority of arboreal birds. That this bird is a valuable ally of the forester and horticulturist can not be doubted.

WRENS: FAMILY TROGLODYTIDAE

Eastern House Wren. *Troglodytes ædon ædon* Vieillot.

The eastern house wren was only moderately common in the farming districts and about the villages and lake shore cottages of the region; as usual it was seen less frequently in and about the more heavily wooded sections than in the vicinity of human habitations. Arrival of this bird from its winter quarters in the South Atlantic and Gulf states may be expected in late April, and continues well into May. The departure for its winter home takes place during the early days of October.

While this noisy and energetic little bird seems to have periods of scarcity in various parts of the State and the country generally, it seems to have regained some measure of its former status in the Oneida Lake region, although it still apparently is much less common than in earlier days. Ralph and Bagg (1890, p. 232) mentioned the disappearance of the house wren in Oneida County between the years 1887 and 1890. They say (*loc. cit.*): "Perhaps the strangest observation we have to record is the entire disappearance of this species which was ten

to fifteen years ago one of our most abundant species, nesting in dozens of bird houses in the city and in every empty shed and wooded bridge in the country."

During our two seasons' work it was very apparent that the eastern house wren was considerably more abundant and more widely distributed in the Oneida Lake region in the summer of 1929 than in 1928. Whether this is a temporary local condition I am unable to say, but certainly some allowance must be made for seasonal fluctuation in numbers. In general it seems that the bird is now on the increase in this region.

While we found it not infrequently all about the lake, the house wren is, without doubt, commoner in the Constantia and Cleveland districts than elsewhere in the territory covered. The bird occurs, as is well known, more commonly in the villages and their immediate environs than in the outlying territory. At many of the summer camps and cottages about Oneida Lake, wren houses have been erected and numbers of them become occupied during the course of the summer.

At the summer residence of Dr. H. E. Luther near Lower South Bay an imposing array of bird houses in the yard includes several that are occupied each season by house wrens. Many of the local bird houses have the entrance hole large enough to admit the English sparrow. The entrance hole should be only an inch in diameter.

The villages of Jewell, North Bay, Brewerton and Sylvan Beach also attract considerable numbers of house wrens, and the same is true of the farming communities and orchards in the territory south of the lake. Dunham Island, too, is a favorite resort. In the outlying wooded sections it is rather scarce.

The eastern house wren sings enthusiastically from morning till night, not only *preceding* the nesting period but also *during* it, and while engaged in hunting food for the young. The rather monotonous succession of short, rapid notes begins slowly, but once started, the song breaks forth spontaneously with vigor and bubbling enthusiasm, to diminish somewhat in pitch as the outburst ceases. Almost any high perch serves as a vantage point from which to utter its lay.

It has been our observation here that the song of the house wren becomes more frequent and vigorous as the season advances, even after mid-July, when singing with many species of birds is on the wane. One of my field notes under date of July 23, 1928, states that "This bird is a much more conspicuous member of the group here now for it is singing more persistently than at any other time during the summer. In this region, at least, its song has been on the increase both in frequency and in volume rather than on the decrease as is the case with so many other species of the region."

In addition to the houses placed for its convenience the house wren selects for nesting purposes cracks and crannies in old buildings, cavities in various situations, about buildings, in hollow trees, etc. The nest is composed of sticks—some of them are of surprisingly large size—and grass and is lined with softer materials. The six or seven finely speckled pinkish eggs are often marked with a distinct wreath at the larger end. Usually two broods are reared, the first clutch of eggs being deposited during May, sometimes very early in the month, while second sets may be looked for late in June and well throughout July.

Nesting birds were observed in most of the localities in which we found the species; they were observed more frequently in and about the north-shore villages than elsewhere. Adults accompanied by young birds not long out of the nest were noted in the vicinity of North Bay as late as August 1.

The pugnacity and belligerency of the house wren, particularly toward other birds, is well known, and the species does, without doubt, destroy both the eggs and the young of a good many species of small birds. The fact that the wren requires more food than the average bird of its size in order to maintain its abundant store of energy, and that the young are fed more frequently than the average bird, serves, in some measure at least to mitigate its destructive tendencies in relation to other birds.

"This wren feeds almost entirely upon animal matter, the few seeds and other vegetable items found in stomachs apparently being picked up accidentally. More than ninety-eight per cent of the total food is animal matter and half of that is composed of grasshoppers and beetles; other important items are caterpillars, bugs, spiders, and ants." (McAtee, 1926, p. 83.) Other insects such as flies, crickets, mayflies and dragonflies are taken together with such items as millipeds, sowbugs and snails. Apparently the birds do not range far from the nesting place in search of food, and so a nesting pair or more in the vicinity of a garden or small orchard is no mean asset.

The cinnamon-brown upper parts, brighter on the rump, the finely barred wings and tail and grayish white under parts will serve to identify the eastern house wren. In addition, the song and the short tail (usually held erect) are characteristic.

Eastern Winter Wren. *Nannus hiemalis hiemalis* (Vieillot).

Only four times have I come across the winter wren in the Oneida Lake region; dates and localities are as follows: May 4, 1928 and May 3, 1929, low swampy, hummocky ground in maple woods, Maple Bay district (Fig. 124); three winter wrens on first date, several on the latter. May 8, 1929, one in a brush heap at edge of Oneida Lake, Shackelton Point. July 30, 1928, several winter wrens in woods on north side of Panther Lake. Although I found no nests at the latter place, this district affords a likely breeding habitat with its dense growth of maple-beech-hemlock-ash trees, together with moist conditions, uprooted stumps and decaying moss-covered logs lying on the forest floor. Two or three of the birds were singing and what a song it was, "full of trills, runs and grace notes, it was a tinkling, rippling roundelay."

The combination of circumstances just cited, namely, the type of habitat, the singing of the birds and the late summer date of their occurrence here indicates that the species nests in the Panther Lake district and possibly elsewhere in the territory.

The eastern winter wren is considered a common migrant in most parts of the State and is a summer resident in various parts of central and western New York. It is particularly common as a breeder in the Adirondacks and the Catskills. In the Cranberry Lake region, Silloway (1923, p. 445) reports young about ready to leave the nest on June 24, and young just out of the nest on

July 31. The bird arrives from the South in late March and early April and ordinarily passes on northward some time during the first three weeks of May. Our few records for the Oneida Lake territory indicate that it is a regular but by no means common migrant and possibly a casual summer resident in this section.

In western and central New York a few remain through the winter, and it is said to be a fairly common winter resident in the southeastern part of the State. However, it is possible that the winters in the Oneida Lake region are too severe.

This is one of our smallest birds, averaging little more than four inches in length. It commonly occurs during migration in and about wooded tracts, as well as in the vicinity of brush piles and the shrubbery of lawns and parks. It is shy and exceedingly active. The smaller size, shorter tail distinctly barred with blackish and usually held well elevated, together with the darker brown both above and below will distinguish this bird from its nearest ally the house wren.

Long-billed Marsh Wren. *Telmatodytes palustris palustris* (Wilson).

Confined as it is in local distribution during the summer, the long-billed marsh wren is, nevertheless, fairly common where it does occur and, in certain low-lying marshes bordering Oneida Lake where rank growths of cat-tails, rushes, sedges and long grasses occur, as well as in some of the outlying marshy districts that support such growths, this noisy, harsh-voiced acrobat is one of the commonest of the passerine birds.

In common with many other small retiring species this wren migrates largely at night. It may be expected to appear in the Oneida Lake region late in April or early in May, but its numbers here do not reach their maximum until well toward the middle of the latter month. My earliest date is May 2, 1929, when a few birds were found in the Cicero Swamp southwest of Clay. This locality, too, probably represents the place of greatest concentration and abundance of the species in the region. Sadler (1926, p. 19) gives April 25, 1925, as the earliest date it was seen. The autumnal movement to its winter home—in the South Atlantic States from southern New Jersey on south into Florida—begins in and continues throughout the month of October.

A mile southwest of Clay, the Rome branch of the New York Central Railroad crosses a vast cat-tail marsh a mile in width and forming a continuation of the great Cicero Swamp which extends throughout the length of the territory south of Oneida Lake. The track lies at the top of a considerable embankment and limited areas of the marsh can be viewed from this vantage point. A sluggish stream (Mud Creek) flows through the marsh, while small open stretches of water are of frequent occurrence. Such a habitat is much to the liking of the long-billed marsh wren and here it nests (Fig. 221). Other places in which we have found this species, though in lesser numbers, are the following:

1. Cat-tail marsh along Black Creek, three and a half miles southeast of Bridgeport. This marsh is similar to but much smaller than the one southwest of Clay. The bird was nesting here on June 24, 1929.

2. Grassy willow swamp at roadside; South Bay district; one bird; May 13, 1929.

3. Cat-tail swamp near edge of Oneida Lake three-fourths mile south of Short Point. A limited amount of narrow-leaved cat-tail (*Typha angustifolia*) grows here. July 8, 1929: Examined six nests; some had been built but recently; all were empty, but the birds were common all through the cat-tails and were scolding vociferously.

4. Small roadside cat-tail marsh two miles southwest of South Bay. Heard here by Mrs. Stoner on July 11, 1929.

5. Moderate sized cat-tail swamp along the railroad track about a mile west of the West Monroe railroad station. Several individuals singing; breeds here; August 3, 1928.

No doubt this marsh wren occurs in other suitable habitats throughout the region that are not visited too frequently by man.

The long-billed marsh wren breeds in loose colonies. Often a nesting pair will construct several nests before the eggs are deposited. Eggs may be looked for late in May, and our data indicate that frequently two broods are reared in a season. Sadler (*loc. cit.*) records nests with eggs at Dead Creek on May 27, 1916. The finely mottled brownish eggs vary in number from five to nine.

Regarding the habits, song and breeding activities of the long-billed marsh wren in this region I have selected several excerpts from my field notes. The quotations are arranged chronologically by days of the month without respect to the year in which the observations were made. Unless otherwise mentioned, all the statements refer to conditions and situations in the Cicero Swamp southwest of Clay.

"June 14, 1929. This is the commonest non-gregarious bird in the cat-tail growth here. It occurs in the cat-tails (*T. angustifolia*) everywhere. Examined ten completed nests, but found eggs in none. Saw two nests in process of construction. Apparently the nesting season is just beginning. The nests are from three to four feet above the oozy marsh floor and are composed of leaves and stems of the narrow-leaved cat-tail; a lining of dried down from the cat-tail spikes is provided. The cat-tail leaves in some of the nests are still moist, indicating that the birds 'select' or take the more pliable blades lying in or near the water rather than the dry hard ones. In some nests a good deal of moss is intermingled with the cat-tail leaves.

"July 2, 1929. Again examined a considerable number of nests. Found only one occupied; it contained a young bird almost naked and unable to fly, but it could *climb* about in the cat-tails, and was exceedingly agile in this regard. The young are highly precocial for passerine birds. There are many nests here now and the birds are calling on all sides.

"July 6, 1928. This is the commonest passerine bird in the marsh and probably is surpassed in numbers only by the Virginia rail and possibly by the Florida gallinule among the other marsh inhabitants. The marsh wrens keep well down in the cat-tails most of the time, but their harsh notes bespeak their presence everywhere. Saw adults carrying food for young. After delivering it they



Fig. 220. Nest of short-billed marsh wren; long marsh grass at abandoned farmhouse two miles south of Lakeport. July 24, 1929.



Fig. 221. Nest of long-billed marsh wren in narrow-leaved cat-tails and arrow arum. Cicero Swamp one and one-half miles southwest of Clay. June 18, 1929.

frequently mounted to the top of a cat-tail stalk or other high perch, there to give voice to their coarse, guttural and more or less variable song, somewhat after the manner of a swamp sparrow. Sometimes the birds rise above the tops of the flags and utter the song as they flutter in the air in a labored, hovering manner. Saw one young just out of the nest and able to fly a little but most of the young are still in the nest.

"As one approaches the nesting territory of these birds one is met by vocal defensive outbursts from them. At the same time they often display seemingly violent physical contortions, bobbing and 'attitudinizing' energetically. On one occasion an individual highly excited at my presence gave a most excellent demonstration of what is commonly known as the 'splits,' i.e., both legs held almost at right angles to the body—while it scolded me. Each foot grasped a different blade of cat-tail, and the unequal swaying of these blades in the wind caused the bird to perform in a manner that might have excited envy in an accomplished human stage performer.

"July 11, 1928. These acrobats are abundant and noisy. Occur everywhere among the rushes. Saw several carrying food for young. Waded out into the swamp for some distance looking for nests; found only one; it was about four feet from the ground, and still under construction. The dead cat-tail leaves of which it was made were twisted about three or four green cat-tail stalks. Some of the material had just been added. Today I have seen adults feeding young, young of the year out of the nest, and nests under process of construction.

"July 17, 1928. Common, and singing in the Cicero Swamp as late as 8:30 p.m., when I left the place. Young out of nest and attended by parents are common now; some of the young are able to make short flights; they are as skillful in acrobatics as are the adults.

"August 7, 1928. The adults are singing almost as much now as they did three weeks ago.

"August 7, 1929. A common bird in the swamp. Still singing. The breeding season seems to be well over, but I heard the food call of young attended by adults. The birds are constantly flying about above the cat-tails, giving their peculiarly characteristic song which has acquired even more of the clucking and scraping tone than heretofore. The birds have their enemies, too, for the red-winged blackbirds frequently pursue and drive them down to the protection of the dense cat-tail growth. I saw one male red-wing attack and pursue a marsh wren through the thicket for some distance."

In both seasons, as above indicated, the song period continued without apparent diminution throughout July, and even into the early days of August, although by the seventh some abatement was noted.

Upper parts brown, crown blackish, unstreaked; a white line over eye; back nearly black, distinctly streaked with whitish; under parts white, the sides, flanks and under tail-coverts tinged with pale brownish.

Short-billed Marsh Wren. *Cistothorus stellaris* (Naumann).

Unlike its long-billed relative the present species is shy and secretive in its habits and, for the most part, remains under close cover. This may be responsible

largely for its apparent rarity in the Oneida Lake region as well as in other parts of the State, and throughout its range in general, for possibly it is commoner in most places than the available records usually indicate.

I did not see the short-billed marsh wren here during the 1928 season, but on May 3, 1929, I saw a single bird on low, grassy, hummocky ground in a sparse elm, willow and alder thicket situated between maple woods and an open meadow near the west side of the mouth of Chittenango Creek. The wren remained close to the ground, never rising high above the dry grass on the hummocks as it half flew, half ran in and about them and the interspersed low bushes. It was shy and persistently refused to come out into the open where it might be viewed for any length of time.

Again on the morning of June 24, I came upon a pair of these wrens in the low grassy expanse one and a half miles south of Lakeport, in Madison County. My attention was first drawn to one of the birds by its song which was uttered from a scrub willow and suggested in some degree the vocal efforts of the long-billed marsh wren. In examining the place further I saw another bird carrying a blade of grass, and after a little search found the nest. It was practically completed—a globular affair, the outer portion composed of the marsh grass growing on a hummock, the blades intertwined and twisted together. It was situated in a low place near an abandoned farmhouse, fifty yards from the main highway. The lining of the nest was composed of dried grass and the well-concealed entrance was on one side. The nest was perhaps a foot above the damp ground. This record establishes definitely, I think, that the species breeds in the Oneida Lake territory (Fig. 220).

Upon returning to the spot on July 5, I noted that domestic stock had been roaming over the place, but after a little search I found the nest, still intact. Its interior was in good condition, but there were no eggs. The birds were nowhere about. However, either the same or another pair had taken up quarters on the opposite side of the road some 200 yards away, in another grassy, hummocky marsh, and one of them was singing lustily from a weed stalk. Although it persistently refused to leave the spot, I could find no nest.

After finding the short-billed marsh wren also in a grassy swale about two miles northeast of North Syracuse, on July 17, and in a low-lying hummocky marsh one mile northeast of the village of Sylvan Beach, on August 12, I have decided that the bird is more generally distributed in the region than I at first suspected. Low-lying, boggy meadows usually supporting more or less of a growth of bulrush (*Scirpus cyperinus* Kunth) are favorite local habitats of this wren. It is partial also to the moist thicketed borders of marsh land.

This bird frequents a different type of habitat from that of the long-billed marsh wren, and it is seldom found in the more extensive deep-water marshes such as that part of the Cicero Swamp, where the latter species, on the other hand, is very common. I have looked in vain there for the short-billed species.

Sadler (1926, p. 19) gives a single record for the short-billed marsh wren at Constantia on May 7, 1921; Eaton (1914, p. 487) records it as breeding in Onondaga County, on evidence of A. W. Perrior, and Saunders (1926, p. 466) records a pair possibly breeding in the Montezuma Marsh area.

In New York the short-billed marsh wren seems to be a local and uncommon summer resident in nearly all parts of the State. It arrives from the South the first week in May and leaves about mid-October. I should not be surprised to find it nesting in the Oneida Lake region more commonly than my findings would indicate, for any number of suitable nesting sites are there offered.

The shorter bill and streaked crown and upper parts together with the different type of habitat usually chosen will serve to distinguish this species from the long-billed form.

THRASHERS, MOCKINGBIRDS, ETC.: FAMILY MIMIDAE

Eastern Mockingbird. *Mimus polyglottos polyglottos* (Linnaeus).

In an open plowed field less than a quarter-mile from the lake shore at Maple Bay, Mrs. Stoner saw an individual of this southern species on May 11, 1928. The bird later alighted on the low branches of a tree where she was able to view it for some time at a distance of about 100 feet. The white wing-patch at the base of the primaries as well as the white markings on the tail feathers were clearly visible with the aid of the glass. I have no hesitancy in accepting this field determination in view of the fact that we had but recently come from Florida where this bird is plentiful and where we had ample opportunity to view it under various conditions.

Although this southern songster has been recorded from the State on numerous occasions, so far as I am aware the locality nearest Oneida Lake from which any record is available is Aurora (Leffingwell, 1925, pp. 140-141), some forty miles southeast of the territory included in the present report. The bird was first seen there on March 3, 1924. As with so many other species of North American birds, this one too seems to have been gradually extending its range northward, and it would not be surprising if additional reports of its occurrence in the Oneida Lake region should be received.

In the South, where everyone knows and loves it, the mockingbird exhibits a liking for the vicinity of man's habitations, not only in smaller towns in agricultural communities but even in proper situations in the largest cities. Its pleasing and varied song may be heard at almost any season, but in quality and frequency is at its best from February on into the summer. Usually the bird chooses a high perch from which to sing. Though it sings much more freely during the day, in Florida I have frequently heard it burst into full song in the night, at almost any hour.

The nest of the mockingbird is usually placed in a vine or a small tree or shrub, at a height of six to thirty feet. Twigs, plant stems, grass, string, hair and other things, with a lining of fine rootlets, make up the nest materials. From three to six bluish green eggs covered with reddish brown spots or blotches constitute the usual clutch.

With the apparent extension of its range to the northward in recent years, it is possible that the mockingbird may yet become familiar to the people of central New York.

Upper parts brownish gray; a large patch of white on lower wings is conspicuous in flight. Under parts whitish. Tail long, slender, rounded, and fuscous.

with outer feather white and the next two or three also showing a good deal of white.

Catbird. *Dumetella carolinensis* (Linnaeus).

Much favorable habitat exists for this pleasing and well-known songster, and it is one of the common summer residents. Although my earliest spring record for the catbird is May 7, 1928, it undoubtedly arrives from its winter home in southern United States, Cuba and Panama a few days earlier. Its numbers locally seem to be augmented by new arrivals until the last week in May, when the peak of abundance is attained. After that it is common in the suitable situations about human habitations and in thickets and tangles in other parts of the territory.

Since so many suitable habitats occur in the region, the local distribution of the catbird is fairly uniform, but certain places that seem to offer unusual attractions may be mentioned briefly. In places along the lake shore where the banks rise to a height of six to fifteen feet, a dense growth of scrub willows and other vegetation often springs up between the water's edge and the top of the bank. Such conditions are seen in the Lower South Bay, Boysen Bay and Shackelton Point districts. The willow swamps in the Short Point and South Bay districts as well as the bushy margins of the Cicero Swamp southwest of Clay also are favored habitats, and so are the extensive cut-over tracts in the Cleveland, Constantia, Jewell and Sylvan Beach districts, now grown up in blueberry, willow and other shrubbery. In the low shrubby willows along Fish Creek, particularly near its junction with the Barge Canal, nesting pairs of catbirds are of common occurrence. In the less thicketed districts on the south side of the lake in the vicinity of Lakeport, Bridgeport and Hitchcock Point the catbird is not so common. In late summer, after the breeding season, catbirds and other species of omnivorous or frugivorous habits, visit freely the blueberry areas to the north and east of the lake such as those in the Cleveland and Sylvan Beach districts. The Bullhead Bay district west of Constantia also has attractions at this season in its pin cherries, high- and low-bush blueberries and high-bush huckleberries. And in the extensive Delahunt property east of Cleveland, in late July hundreds of catbirds, towhees, robins, cedar waxwings, song sparrows, Baltimore orioles and other species join in feasting on a similar wealth of wild fruits. The concentration of a considerable number of individuals and species within an area offering a plentiful supply of food of a certain kind, is particularly well illustrated by the conditions found here, where birds of more or less diverse individual habits are drawn together through community of interest, namely, a plentiful supply of food.

The catbird is an alert, energetic and saucy bird, but usually remains well concealed in the thickets. The common name of this bird is derived from its cat-like "mew," but its proficiency in imitation is by no means limited to this note. A series of harsh scolding notes is often uttered, but at its best the catbird is a pleasing songster. The song is varied, prolonged, much broken both in time and quality and exhibits a considerable range of pitch. While resembling in qualities the song of the brown thrasher, it seems to me somewhat softer and mellower. In the Big Bay district and other places I have observed individuals

sitting contently in the protecting shade of a bush and singing for minutes without apparent effort.

From late July on, the catbird sings very little, but it raises a considerable disturbance and expresses itself in no uncertain vocal terms if an intruder encroaches upon its domain.

It usually builds its rather bulky nest—consisting of sticks and straw and lined with rootlets—in a clump of bushes, a low tree or a tangle of grape or ivy vines, often near water. Three to five eggs form the usual complement, but I have found four to be the commonest number here. The eggs are bluish green in color. My earliest nesting date is May 31, 1928, when a nest with one egg was found in a wild gooseberry bush 100 feet from the lake shore. Other nesting data taken from my field notes are as follows:

"June 1, 1928. Muskrat Bay district. Common in undergrowth here; nest with three eggs.

"June 1, 1929. Catholic Cemetery east of Cleveland. Nest three feet up in hackberry sapling; bushy fence row. No eggs yet. (A week later one egg had been laid.)

"June 7, 1928. Hitchcock Point. Nest in white thorn tree four feet up.

"June 17, 1929. Emmons' woods. Nest three feet up in small hemlock tree; contained three young about four days old.

"June 20, 1928. Vandercamp woods northwest of Cleveland. Two nests with four eggs each; in bushes, four and seven feet from the ground, respectively.

"June 22, 1929. East side Chittenango Creek, Hitchcock Point. Nest with five young a week old. Nest in Virginia creeper vine clinging to elm tree, and seven feet above the water of the creek.

"June 27, 1928. Jewell (West Vienna) district. Nest in a dense growth of choke cherry trees, seven feet from the ground and twenty yards from the lake shore. The nest contained two very lousy young, which I banded.

"June 28, 1928. Vandercamp woods. Not uncommon in roadside bushes here. Nest in lilac bush at roadside contained three young about a week old."

While it is possible that occasional second broods are reared in the region, our observations tend to show that the habit is not general and that most of the eggs are laid during the month of June. My first record for young out of the nest is July 13, 1928, when a brood was discovered in the Shackelton Point district. From that date on to the conclusion of our observations young birds almost as large as the adults and attended by them were frequently noted. On August 10, 1928, in the Big Bay swamp near Three Mile Creek, two young birds that had just left the nest were banded. At this time the catbird seemed to be the commonest non-social passerine bird in this district and its calls were heard on all sides. As is the case with the thrushes and some other birds, the young catbirds are fed by their parents for a considerable period after they have left the nest.

"About forty-four per cent of the diet of the Catbird is made up of insects and other invertebrates, and three-fourths of this quantity is contributed by ants, beetles, caterpillars, and grasshoppers" (McAtee, 1926, p. 78). Most of the insects taken are destructive from the viewpoint of the agriculturist and forester.

The principal item of criticism concerning the food habits of the bird is its fondness for cultivated fruits and berries. However, the abundance of wild fruit such as elderberries, blueberries, wild cherries, sumac and others, which usually grow in proximity to its nesting site serve sufficiently to distract its attention from the cultivated varieties, so that ordinarily not much damage is sustained in this region.

The slaty gray plumage, black crown and tail with chestnut under tail-coverts serve well to distinguish this species. The sexes are alike in plumage.

Brown Thrasher. *Toxostoma rufum* (Linnaeus).

In this territory the brown thrasher—often erroneously called “brown thrush”—is much less common than its near relative the catbird; both species are summer residents and are sometimes found in the same situations. The brown thrasher seldom occurs in the districts on the south side of Oneida Lake, its principal strongholds being the bushy thickets in the area extending eastward from West Monroe to North Bay, and around the east end of the lake to the village of South Bay.

Although my earliest record for this species here is May 7, it is likely to put in its appearance in April, any time after the middle of the month. I have observed it most often during May, June and August. My July records are very few. More specifically the localities in which I frequently found the thrasher are the vicinity of Fish Creek railroad station and the thickets bordering the woods north of the villages of North Bay, Jewell, Cleveland, Bernhard Bay and Constantia. A cut-over area immediately north of the State highway a mile west of North Bay and now covered with a tangle of blueberry, alder, willow, aspen, birch and other saplings and shrubbery and a similar area on the extensive Delahunt property northeast of Cleveland, are the localities in which I found the species most common. Here, in late July and early August, at the height of the blueberry and pin cherry season are found not only the brown thrasher but also a host of other birds chief among which are the Baltimore oriole, song sparrow, towhee, cedar waxwing, catbird and robin. I have seen the brown thrasher also at Kibby Lake and at Francis and Gordon ponds. Strangely enough I have not a single field record for this species from any of the districts on the south side of Oneida Lake. This does not necessarily mean that it does not occur there, for it probably is to be found sparingly, but that suitable habitats are rather scarce. High, dry thickets, hillside pastures and shrubby undergrowth are as plentiful on the north side of Oneida Lake as they are few on the south shore and its environs.

The brown thrasher is one of our finest songsters. Its voice partakes somewhat of the quality of the songs of both the mockingbird and the catbird. It is fuller and richer than that of the latter, but not so persistent as that of the former. This thrasher gives its best exhibition from a high perch, such as a tall dead tree in an open field or the top of a white thorn or aspen, early on sunny mornings in May and early June. The thrasher is a rather suspicious bird, especially during the nesting season, and resents intrusion into its domain by a sharply whistled “*wheeu*,” often followed by a sharp “*click*.”

The brown thrasher nests in this territory throughout the months of May and June. Its nest of sticks, straws and coarse rootlets is placed in a bushy thicket near, and sometimes on, the ground. On May 7, 1928, near the Barge Canal a half-mile west of Fish Creek railroad station, I saw a thrasher carrying nest material into a roadside brush pile; and on June 15, in a dry shrubby, roadside field a half-mile south of Kibby Lake I saw an adult carrying food to young in the nest. The usual complement of eggs is four.

Occasionally an individual may perhaps remain over the winter in certain localities, but usually the rigors of mid-winter are too severe. Ordinarily by the close of October all the local thrasher population has left for the winter home in southern United States.

The thrasher is a ground-loving bird and early in the season before the wild fruits are ripe spends a good deal of time scratching for food among the leaves under cover of bushy tangles. When the wild fruits ripen later in the summer it frequents the low bushes and trees. During the time that the bird is in the State thirty-six per cent of its food is vegetable matter (McAtee, 1926, p. 82), of which wild fruits, mast, and corn—mostly waste—form the major part. Of the animal food, beetles are the main item. Many of these or their larvae are harmful particularly to the interests of forestry, agriculture and horticulture. In addition, the brown thrasher takes considerable numbers of "caterpillars, grasshoppers, ants, bugs, spiders, millipeds, and snails" (McAtee, *loc. cit.*). While the bird is not sufficiently common in the Oneida Lake region to be of any marked economic importance, it must nevertheless be counted among the beneficial species and an ally of the workers of the soil.

Thrashers are not found in flocks, and rarely associate with other birds although common wants and food habits may bring them together. In this region they shun altogether the immediate vicinity of human habitations, in which respect they differ somewhat from their kind in the middle west. They are active birds on the ground and can half run, half fly through even heavy tangles with remarkable speed.

The brown thrasher is a long, slender reddish brown bird—longer than any of our thrushes, proper—with a long tail and heavily streaked under parts, a long decurved bill and yellow eyes.

THRUSHES, BLUEBIRDS, ETC.: FAMILY TURDIDAE.

Eastern Robin. *Turdus migratorius migratorius* Linnaeus.

Volumes of poetry, prose—and some fiction—have been written on this popular harbinger of spring, perhaps the commonest and most generally distributed native bird in the Oneida Lake region.

While a few individuals may remain over winter in the territory, most have departed for the South by early November—to return in the spring, sometimes as early as the last week in February. However, the bulk of the robins arrive in early March, and nesting activities are well under way by May 1, to continue even as late as August.

The eastern robin has adapted itself completely to the advances of civilization and while it occurs in the outlying wooded and semi-wooded districts of the

Oneida Lake territory it prefers to feed and to nest in proximity to human habitations. It is present in greatest numbers, locally, about the camps, summer cottages and farm buildings near the lake shore. One of the residents at Shackelton Point told me that on the porch of an unoccupied cottage there, six robin nests had had young in them at the same time, and that all the birds had been reared successfully.

The well-known cup-like nest of mud held together by grass stems and weed stalks and lined with finer grass blades, is a common sight on window ledges, beams and various projections of buildings as well as in the crotches of trees and bushes. The bluish green eggs are usually four in number.

Sometimes unusual sites are chosen for the nest. On May 23, 1928, I banded four young robins in a nesting box that had been set up for purple martins that arrived too late. This bird house was on a slender pole fifteen feet high and consisted of a single compartment, well lighted by several small windows and a door. It was situated in an open area ten feet from a dwelling house—too close to it, I think, to be attractive to martins (Fig. 198). Near Jewell a nest containing two eggs was discovered in a roadside alder tree on June 14, 1928. The thick willow growth west of Short Point is a favorite nesting spot, as are also the low flats along Chittenango Creek near its mouth. Near Cleveland, a nest was found in a small cow shed near the highway. We also found nests at varying heights from the ground—from three to thirty feet.

All through the months of May, June and July, mating, nest building, incubation and rearing of young occupy the adults; and after May 15, young birds of all ages are much in evidence throughout the season. My first record for young is May 8, 1929, when, at a cottage in the Lower South Bay district, a nest containing nestlings a week old was discovered. In a number of nests the young birds were very heavily infested with lice (Mallophaga), yet appeared to be in a thriving condition. Mites (Acarina), too, are an ever-present parasite on the young birds.

It is apparent that the robin in this region breeds all through the summer, and a few of our later records relating to this activity may be of interest.

"July 23, 1928. Vicinity Cleveland. Adults carrying food for young.

"July 24, 1928. Lower South Bay; vicinity of trolley station. Adults feeding young in a nest in maple tree, about thirty feet up.

"July 26, 1928. Vicinity of Cleveland. Nest with three eggs in cow shed." Twenty-four hours later the eggs had hatched.

"July 30, 1928. Roadside near Constantia. A robin collecting nest material.

"August 1, 1928. Sylvan Beach district. A robin carrying nest materials.

"August 6, 1929. Sylvan Beach district. A robin carrying food for young.

"August 12, 1929. Lakeport district. A robin carrying food for young."

Toward the close of the nesting season, robins and other species of birds congregate in the extensive blueberry, huckleberry and pin cherry thickets found in the Constantia and Cleveland districts, to feed upon the abundance of wild fruit. The paved State highway passes near these congregating places and many birds here are killed by speeding motor cars.

The phenomenon of flocking of the robins is apparent from late July on, when great numbers of them may be seen nightly flying toward such outlying places as the Cicero Swamp and the Big Bay Swamp where they pass the night. This flocking is preparatory to the southward movement, just as the northward movement in spring is preceded by the formation of great flocks. As the summer advances, the birds become more wary and difficult of approach.

A bird so plentiful as the robin is can not help making its presence felt in an economic way. Examinations of stomach contents of this bird made by the U. S. Bureau of Biological Survey reveal the fact that in cultivated or semi-cultivated areas it takes large numbers of beetles and caterpillars together with some bugs, Hymenoptera, flies and grasshoppers, spiders, millipeds, sowbugs, earthworms and snails. Of these items, certain predacious beetles, the parasitic and predacious Hymenoptera and the earthworms are beneficial to man; hence their destruction by the robin constitutes a count against it. In addition, of the approximately sixty per cent of vegetable food taken by it, cultivated ripe cherries form a considerable part during the season. I have often observed the robin feeding upon ripe cherries in this territory and have listened to the complaints of numerous farmers concerning its habits in this respect. Nevertheless, the growers have not the dislike for the robin that they have, e. g., for the bronzed grackle.

In the area under consideration the abundance of wild fruits in some measure lures the birds from the cultivated varieties. In addition to the blueberries and wild cherries there are in the partly cleared areas quantities of blackberries, raspberries, sumac, huckleberries, Virginia creeper fruit and wild grapes. Hence the concentration of the robin in such places as the Bullhead Bay district, the Delahunt woods, the open blueberry thickets in the vicinity of North Bay, Fish Creek and Verona Beach districts and other similar places is well marked in late July and throughout August. Unfortunately, most of these wild fruits are not available until the cherry season is past, so that whatever damage the birds do has already been sustained. However, this damage is not of impressive proportions, and the sentiment of the community was probably reflected by a local resident who remarked that "The robin does some damage, but we shouldn't like to be without the bird."

Of course the diet of nestling birds is almost wholly insects, and in July, particularly during the last three weeks of the month, field observations indicate that mayflies make up a considerable item of their food. I have often seen adult birds carrying as many as six or eight of these large, brown, soft-bodied insects, usually very abundant and rather troublesome to the cottagers. Frequently on warm evenings myriads of mayflies arise from the waters of the lake and settle on the screens and sides of cottages as well as upon persons abroad at that time. And the stench from the decaying bodies of these insects, often washed up in great windrows along the shores at Lower South Bay, Maple Bay and other places, is at times almost overpowering. Bathing in the lake in such periods is largely curtailed. Doubtless robins as well as other birds assist in some degree in keeping down the numbers of these insects.

The adult robin is familiar to all, but the spotted young bird is confusing to many persons. In addition to the whitish spots on its upper parts, the light under parts are spotted with black.

In the early part of the 1928 season I saw on two occasions in the Lower South Bay district a partial albino male robin; both the upper and under parts were well marked with white. Partial albinism is not uncommon in the eastern robin, but complete albinism is rare. Albinistic specimens are seldom permitted to live long, for any unusual bird is promptly made the target for some hunter's gun.

Wood Thrush. *Hylocichla mustelina* (Gmelin).

In the Oneida Lake territory the wood thrush is an uncommon summer resident, its place apparently being taken largely by the veery and to some extent also by the hermit thrush. My earliest spring record is May 3, which is, I think, about the average date of its arrival in this area. The bird leaves for its winter quarters in Mexico and Central America in late September or early October. Concerning the occurrence of this bird in the State, Eaton (1914, p. 516) says: "In New York it is a summer resident in all portions of the State but is not uniformly distributed." It seems to be most common in the south-eastern part of the State.

Heavy mixed woods with second growth maple, birch or beech seem here to appeal to it most, particularly areas adjacent to bogs or small streams. Consequently, most of my records for the wood thrush refer to the north side of Oneida Lake. The localities where I found the bird most frequently are the Widrig woods northeast of Cleveland, the Vandercamp woods, mixed woodland northeast of West Monroe, wooded section north of Bernhard Bay, and the Francis Pond and Panther Lake districts.

The wood thrush is partly arboreal and partly terrestrial in its habits. It confines neither its feeding nor singing activities to one or the other situation, but its nesting place is usually in small trees. It is a solitary species, but sometimes an area of satisfactory feeding or breeding conditions may be occupied by several pairs. This thrush is not partial to the immediate vicinity of human habitations, except occasionally during migration when it may be found about wooded lawns.

This thrush is a desirable bird from an economic standpoint, and furthermore has a strong aesthetic appeal. Its song is one of the most pleasing and may be heard throughout the summer until mid-August.

Chapman (1914, pp. 492-493) characterizes the song of the wood thrush as follows: "The songs of the Wood and Hermit Thrushes are of the same character, but, while the Hermit is the more gifted performer, the Wood Thrush does not suffer by comparison. His calm, restful song rings through the woods like a hymn of praise rising pure and clear from a thankful heart. It is a message of hope and good cheer in the morning, a benediction at the close of day: The flute-like opening notes are an invitation to his haunts; a call from Nature to yield ourselves to the ennobling influence of the forest." These notes have been written "*ee-o-lee*" and Chapman's interpretation of them into "Come to me"

is suggestive of his above quoted statement. The short sharp call notes "*pit-pit*," also are a part of the wood thrush's vocabulary as well as a dull "*put-put*."

The nest of the wood thrush is usually placed in the crotch of a sapling or on the limb of a tree at a height of eight to twenty-five or thirty feet above the ground. The two nests we found in the Oneida Lake region were in slender saplings. One, found June 8, 1928, and containing eggs, was situated in damp deciduous woods at Phillips Point; the other, found on July 19, 1929, was in a small beech sapling in a heavy mixed woods three miles north of Bernhard Bay village. This nest was composed of dried leaves and grass; the inside lined with mud, smooth and firm, so that it had the color and somewhat the texture of the outside of a cleaned and dried cocoanut shell. The young birds, with the parents, were a few yards from the nest and had evidently left it but a short time before. On July 31, 1928, in a wooded tract south of Constantia Center, I found an adult attending young of the year just out of the nest. Nests with eggs, usually four, are likely to be found almost any time between mid-May and the early part of July.

According to McAtee (1926, p. 89), approximately forty per cent of the food of this species is composed of vegetable material, chiefly wild fruits such as mulberries, wild cherries, dogwood berries and blueberries. The sixty per cent of animal food consists mainly of beetles, caterpillars, hymenopterans including ants, flies, true bugs, grasshoppers, millipeds and spiders. Many of these forms are injurious to forests and forest products, so that the wood thrush is to be classed among our beneficial species of birds.

The large size, cinnamon brown upper parts—brightest on the head, and the white under parts with large round black spots particularly on the breast are good marks for field identification.

Eastern Hermit Thrush. *Hylocichla guttata faxoni* Bangs and Penard.

This hardy bird is a moderately common summer resident in the Oneida Lake region and breeds in the more heavily wooded sections on the north side of the lake. It is the earliest of the thrushes proper to arrive from its southern winter home in the spring, and individuals are often seen on lawns and in woodland the last week in March. This thrush is reported (Eaton, 1914, p. 526) to be more common as a summer resident in the Canadian zone of the Catskills and the Adirondacks. It occurs more sparingly as a summer resident in other parts of the State. The southward movement begins in late October and continues well through November.

As with the veery, cool damp forests are the favorite retreats of the hermit thrush. It seems to fluctuate considerably in abundance locally, and during the 1929 season I found it much commoner than during the preceding summer. Localities in which I found the bird most common are Short Point district, Shackelton Point district, mixed woods north of Constantia, Bernhard Bay, Cleveland, Jewell, Gordon Pond, Panther Lake, Verona Beach and Maple Flat districts. When the breeding season begins the birds become shy and are seldom seen unless one comes upon them unawares in the thicket. Once the bird is aware of the intruder, with a flirt of its bright rufous tail and a low "*chuck*"

it flits away to a low limb in a more remote part of the woodland, there perhaps to break into song.

The hermit thrush is an excellent songster, beginning its musical efforts in earnest about May 15 and continuing them later in the season than in the case of the veery. In late July and early August the song is rendered with somewhat less vigor than in the early season. The song of the hermit is something like that of the wood thrush, but possesses a soft, flute-like quality and a finer scale of modulation; it also comprises a greater variety of notes than the song of the wood thrush. On July 26, 1929, I saw a hermit in full song at the very top of a fifty-foot aspen in the second growth area of the Widrig woods northeast of Cleveland. The series of full, flute-like notes was often *followed* by a series of fine, high-pitched and scarcely audible notes which in turn were followed by the lower, flute-like series. The high-pitched notes that one thus hears are *not* a substitute for the lower ones, but are given in addition to these latter notes. Silloway's interpretation of this performance (1923, p. 441) leads the reader to believe that the bird has two songs, whereas my notion is that the low and the high series of notes are different parts of the *same* song, the one series being strictly continuous with the other. In northern Michigan I did not hear the male sing near the nest while the young were in it, but the "familiar high pitched call very like that of the cedar waxwing was often given" (Stoner, 1920, p. 20).

All the nests of the eastern hermit thrush that I have seen here and elsewhere have been on the ground, usually in an open place surrounded by dense woods. The following excerpts from my field notes will give some idea of its nesting habits in the Oneida Lake region.

"June 10, 1929. Hemlock-beech-maple-birch woods four miles north of Cleveland; parent carrying food to young.

"June 16, 1928. Hemlock-beech-maple woods three-fourths of a mile north of Jewell; saw one hermit thrush and heard others in woodland here and north of the village of North Bay. Saw one carrying a section of an earthworm; must have young in the nest.

"June 18, 1928. One and one-half miles southeast of the Maple Flats Baptist Church, saw a young hermit thrush, able to fly a little but still attended by the parent which I saw nearby. First young I have seen out of nest.

"June 20, 1928. Vandercamp woods, F. C. Soule estate, two miles northeast of Cleveland; hermit thrush common. Nest on ground thirty feet from well traveled highway leading through estate grounds; composed entirely of white pine needles; contained three young about five days old; young banded on June 28, when they were ready to leave nest.

"July 20, 1929. Widrig woods two miles northeast of Cleveland; hermit thrush incubating four eggs in nest situated on ground beneath a small ground hemlock bush and among dense growth of ferns in an open place (unused road) in a low-lying mixed woods; nest composed of dried grass and lined with pine needles (Fig. 231). This is a late date for eggs in the nest."

The proportions and kinds of animal and vegetable food taken by the hermit thrush are very similar to those of the veery and other thrushes. Fruits of the "red cedar, green brier, bayberry, hackberry, pokeberry, juneberry, sumac,

black alder, Virginia creeper, dogwoods and blueberry are most frequently taken." Ants and other hymenopterans, beetles, caterpillars, bugs, flies, crickets and spiders form the bulk of the animal food taken (McAtee, 1926, p. 92).

Olive-backed Thrush. *Hylocichla ustulata swainsoni* (Tschudi).

This species resembles somewhat the gray-cheeked thrush, but has a more pronounced buffy tinge on the throat and upper breast together with eye-ring and lores of the same tinge. It is more common and less shy than that species and is frequently observed on lawns or sitting on the lower branches of shade trees.

In the Oneida Lake region the olive-backed thrush is a fairly common migrant. My earliest record for it is May 7, when I saw a bird in the maple trees near the lake shore at Sylvan Beach. My latest spring record is June 1, in both the 1928 and 1929 seasons. On the former date an individual was seen in a deep, boggy hemlock woods one and one-half miles northeast of Cleveland, while on the latter occasion several individuals were observed in the Muskrat Bay district. Between these dates the species has been observed frequently in suitable localities all around the lake. It seems to reach the height of its local abundance between May 12 and 20, but I should not consider it a particularly common bird here.

This species breeds in the Canadian and Hudsonian zones and in New York State it is a common summer resident in the Catskills and the Adirondacks, particularly in the higher forested sections. In the western Adirondack forest, nesting begins in June (Silloway, 1923, pp. 441-442), and for the nesting site the birds prefer young evergreens. The early June records for the Muskrat Bay and Cleveland districts suggest the possibility of its nesting in the Oneida Lake region, but I have no evidence. Birds returning from the North are likely to be seen in the region between early September and mid-October.

During the spring migration the olive-backed thrush is usually a quiet retiring bird, sometimes occurring in loose flocks or groups. In my experience it does not often sing at this season, but its low "whit" is most often heard. The song is something like that of the veery, but according to Silloway (*loc. cit.*), "the notes have a bell-like quality easily distinguishable."

Gray-cheeked Thrush. *Hylocichla minima aliciae* (Baird).

The gray-cheeked or Alice's thrush is a fairly common migrant in the Oneida Lake region, my earliest spring record being May 8 and my latest, June 16. It is likely to be seen in autumn between mid-September and late October, but I believe that it is more common in spring than in fall. My locality records for the region include practically all the wooded sections about the lake. In the woods north of Cleveland, Jewell and Bernhard Bay one can always be sure of seeing this shy and retiring bird in late May and early June. Other localities are Hitchcock Point, Short Point, Verona Beach, Big Bay swamp and Muskrat Bay districts.

The gray-cheeked thrush breeds in the Hudsonian zone and winters in northern South America.

This bird is sometimes found about lawns and shrubbery and in the vicinity of houses as well as in forested sections, but owing to its extreme shyness it is less frequently seen than are some of our other thrushes. In central New York the species most likely to be confused with the present one is the olive-backed thrush. While both are uniform olive-brown above, the gray-cheeked has little or no buffy on the breast and sides of the throat, has grayish eye-rings and gray cheeks.

On June 1, in the Muskrat Bay district, I watched one of these birds for some time as it took its morning bath in one of the pools of shallow water in a bog. The ablutions were continued for several minutes and were accompanied by a great deal of fluttering and splashing of water. Then followed a most careful and meticulous preening and oiling of the contour feathers; particular attention being given the tail and large wing feathers, the vanes of which were run carefully through the mandibles so that the disengaged hooklets—if any—would be re-engaged. The entire procedure lasted between ten and fifteen minutes. Of course this habit is not peculiar to the gray-cheeked thrush—most birds are inveterate bathers if opportunity offers—but I happened to see the procedure carried out in more detail with this bird than with most others observed.

Extensive studies of the stomach contents made by the United States Bureau of Biological Survey indicate that about three-fourths of the food of the gray-cheeked thrush consists of animal matter. Beetles, ants, wasps, bees, caterpillars and grasshoppers make up the main bulk. Wild fruits comprise the greater share of its vegetable food (Beal, 1915, pp. 11-13).

Veery. *Hylocichla fuscescens fuscescens* (Stephens).

The veery or Wilson's thrush is the commonest of the three breeding species of thrushes, proper, found in the Oneida Lake region. The hermit thrush is its closest rival while the wood thrush falls far behind in point of numbers. My first record for the 1928 season was May 8, and for the 1929 season, May 9. Sadler (1926, p. 20) gives May 3, 1913 and 1922, as the earliest dates for the bird in the Syracuse district. The species departs in September, for its winter home in South America.

This thrush is generally distributed throughout the territory, being found in most moist woodlands all around Oneida Lake. Although its stronghold appears to be in the heavier hemlock-beech-maple tracts to the north and east of the lake, where there is a dense cover of ferns and other herbage, I have found it to be a common bird in the willow thickets of the Short Point, Muskrat Bay, Hitchcock Point, Oak Orchard and Cicero Swamp districts. While the veery was a common bird here during the 1928 season it was even more plentiful in the summer of 1929. By way of indicating its status I will quote from my field notes of May 22, 1929: "Never have I seen so many individuals of this species in one locality as in the Shaw Point district this A.M. Altogether, we saw well on to a hundred birds in the low, boggy woodland, in open fields bordering, and on plowed ground all over the district. 7:00-11:00 A. M.: A concerted movement of these birds must have taken place toward this district in the last day or two. Its numbers here today were amazing in view of its solitary habits."

Such remarks as "the commonest thrush" and "heard on all hands" occur frequently in my field notes for this species.

Other localities in which I have found the veery particularly common are the birch and blueberry thickets east of Verona Beach, hemlock and other woods south of Bridgeport and Lakeport, Toad Harbor and Oakland Beach districts.

While it is rather shy and retiring at all times, the veery is abroad and more in the open during the early part of May. As the nesting season approaches it becomes more unobtrusive and keeps well to the deeper thickets, where it is more often heard than seen. The call note of the bird, "teweu," greets one on every hand as he pushes through the low boggy birch, alder and blueberry thickets in the Verona Beach district, the moist hemlock woods north of Cleveland or the low-lying elm-ash-maple tracts south of Lakeport or the swampy maple groves in the Brewerton and Lower South Bay districts. "His song is a weird, ringing monotone of blended alto and soprano tones. Neither notes nor letters can tell one of its peculiar quality; it has neither break nor pause, and seems to emanate from no one place. If you can imagine the syllables *vee-r-r-hu* repeated eight or nine times around a series of intertwining circles, the description may enable you to recognize the veery's song." (Chapman, 1914, p. 493.) It is not until late May that the veery exhibits its most pleasing and voluble vocal talents. After the middle of July its singing ability diminishes rapidly, and in late July and August the call notes comprise its principal vocal efforts. In this respect it differs from the other common thrush (the hermit thrush) which exhibits at least some degree of singing ability until early August.

Toward the end of May nesting duties begin to occupy the attention of the veery in the region. The following are excerpts from my field notes, chronologically arranged, giving some notion of this activity as I observed it here.

"May 29, 1929. Veery common in birch and alder thickets one mile north-east of Sylvan Beach; saw one carrying nest material.

"June 27, 1929. Heard and saw several in the Oak Orchard district. Found a nest with incubating bird in a moist, shady willow-aspen-elm thicket on the east bank of Oneida River, thirty yards from the water's edge. The nest was eighteen inches from the ground and rested on the bases of a clump of 'suckers' that sprang from a willow tree about eight inches in diameter, standing twenty feet from a little used highway. Leaves and grass comprised the major part of the nest which was without an intermediate layer of rotted wood or mud. Three veery eggs and a cowbird's egg were in it. A dense thicket of poison ivy (*Rhus microcarpa*) surrounded the nesting site.

"June 28, 1928. Francis Pond; parent feeding young out of nest, on limb of a dead tree.

"July 3, 1929. Heard the veery in Parker woods one and one-half miles southwest of Lakeport; also saw one bird with food for young.

"July 9, 1928. Lower South Bay, Clay and Oak Orchard districts; a common bird in the woodland everywhere; the adults are now calling to the young which have left the nest but are unable to fly much.

"July 12, 1928. McClanathan woods; saw one young veery here; about adult size but with more heavily spotted breast.



Fig. 222. White oak, black oak, pitch pine and hemlock woods one mile east of Verona Beach. August 13, 1928.



Fig. 223. Nest and young of veery. Young about ready to leave nest. Blueberry and fern undergrowth in woods illustrated in Fig. 222. July 22, 1929.

"July 16, 1928. Emmons' woods; several birds calling 'ke-ough' to one another, and to young of the year out of the nest and well able to fly.

"July 18, 1929. Delahunt woods; blueberry thickets; adults and young out of nest a week to ten days.

"July 22, 1929. Pitch pine and oak woods, high sandy ground three-fourths mile east of Verona Beach (Fig. 222). Nest with three young about ready to leave (Fig. 223); nest on ground in a blueberry and fern thicket; composed of oak leaves and dried grass, with a lining of fine rootlets and dried grass; two young banded as No. 319025 and 319026; the other one escaped by running and hiding. Nest contained also the elytra of a carabid beetle and part of a small millipede.

"July 24, 1928. Frenchman Island; one young veery of the year seen; the species evidently breeds here.

"July 30, 1929. Willow and dogwood thickets near Fish Creek railroad station; veery carrying pellets of excrement from young in nest. Immature bird seen in birch-alder thickets east of Verona Beach."

About forty per cent of the food of the veery is vegetable substance of which, according to McAtee (1926, p. 90), the principal items are wild strawberries and blackberries, wild cherries, blueberries, elderberries, wild grapes and fruit of the sumac and dogwood. Of the animal food, "beetles, ants and other hymenoptera, caterpillars, grasshoppers, and spiders are the principal constituents." (McAtee, *loc. cit.*)

In the Oneida Lake region early in the season these birds frequent the vicinity of plowed fields, especially those bordering low wooded thickets. In such situations I have seen the birds catching insects after the manner of flycatchers, i. e., from a perch on a limb, low plant or wire fence, darting out quickly to seize a passing insect, then alighting on the perch again, ready to sally forth after the next insect that shows itself. After the middle of July the veery, along with a good many other species, congregates in numbers in the cut-over districts such as the Delahunt property northeast of Cleveland where blueberries, pin cherries and dogwood berries are abundant.

The uniform cinnamon brown upper parts, and the white under parts *lightly* spotted with dusky and *strongly* tinged with dusky on the breast, are helpful field characters.

Eastern Bluebird. *Sialia sialis sialis* (Linnaeus).

In the Oneida Lake territory as in most other parts of New York State the eastern bluebird is a common summer resident. It arrives early in the spring and may be looked for during the first days of March, or even in late February if the season is mild. Possibly a few may remain all winter in some of the sheltered cedar bogs or other situations, but even though it is a rather hardy bird, the southward movement is generally over by the close of October.

The numbers of the bluebird in different sections of the State appear to fluctuate considerably from year to year due, probably, at least in part, to mortality from cold and lack of food. While the bird was common in both the 1928

and 1929 seasons, there was no doubt of its somewhat greater abundance throughout the latter.

Localities about the lake, in which the bluebird is not found are very few; it is not a woodland bird, but prefers more or less open conditions. Clearings about cottages and farm houses, orchards, particularly old ones where hollow apple trees are found, stumpy lots, swamps and ponds such as are of frequent occurrence in the district north of the lake, cultivated fields especially if dead trees occur in them or along the fences—such are the places usually selected by this plaintive-voiced yet pugnacious bird. Among the localities offering particular inducements to the bluebird may be mentioned the stump-dotted Gordon Pond (Fig. 213); Cicero Swamp, which supports numerous dead trees; the Oak Orchard district and areas south of Lakeport and Bridgeport with their vast number of dead chestnut trees; the vast swamp bordering the east side of Big Bay, and the clearings along the New York, Ontario and Western railroad track and the State highway both of which parallel rather closely the north shore of Oneida Lake and lie on the average not more than one-half mile from the water's edge.

At many points about the lake, nesting boxes have been provided for the bluebird. Still more might be done in this respect for this desirable species even though such interlopers as the English sparrow and the European starling often appropriate these homes for themselves. Boxes set up on fence posts or short poles are less likely to be usurped by these birds than are those placed on tall poles or nailed to trees or buildings.

The bluebird usually builds its nest in a hole in a tree, fence post or stump or in a box provided for it. Grass and weed stalks make up the bulk of the nest, with a lining of finer grass. The first clutch of eggs is frequently deposited in late April or early May. They are light blue in color and vary in number from four to six. No sooner is the first brood of young well out of the way than the second set of eggs is laid, and not infrequently three sets are deposited in a season.

On May 21, 1929, in the Constantia district, a nest with eggs was found in a hollow apple tree in an old orchard. On May 29, 1928, a nest with half-grown young was found in another such apple tree near the West Monroe cemetery. Near Bernhard Bay on June 10, 1929, a female was observed carrying a pellet of excrement. On June 10, 1929, at an unoccupied summer cottage about two miles north of Cleveland, a nest containing three eggs was found. This nest had been built on a joist immediately under the roof of the building.

In late June and through July, birds of the year attended by their parents were fairly common in open places along the edges of woodland, especially about aggregations of dead chestnut trees in the Oak Orchard district and in similar situations four miles south of Oneida Lake, between Bridgeport and Lakeport. From mid-July on to the close of our period of observation, young birds able to fly well, but still attended by the parents also were seen in numbers on the telephone wires all along the State highway on the north side of the lake. At this season the bluebird, too, is a frequent visitor in the blueberry, pin cherry and huckleberry thickets of the area. The Delahunt woods bordering the State

highway, the cut-over districts north of the State highway two miles west of Bernhard Bay and the open, sparsely wooded area one-half mile east of Verona Beach are examples of this type of habitat.

The bluebird's song is a soft, low-pitched warble of four or five notes, the syllables "*tu-ree-a-lee*" being frequently repeated. A characteristic low call is often given during flight, and when agitated the bird utters a harsh "*chat*."

About seven-tenths of the bluebird's food is composed of animal matter of which insects make up the bulk. "The large components of the animal food of this bird, in order, are grasshoppers and crickets, beetles, and caterpillars; ants and other hymenoptera; bugs and spiders are of some consequence . . ." (McAtee, 1926, p. 94). Most of the vegetable food is wild fruit, of which in the Oneida Lake region, blackberry, raspberry, sumac, elderberry, pin cherry and Virginia creeper probably make up the largest part.

The only other bird of the territory likely to be confused with the bluebird is the male indigo bunting. However, the brighter blue upper parts, wings and tail, the reddish brown throat, breast and sides and the white belly of the male of the present species will at once serve to distinguish it. In the female bluebird, the upper parts are grayish blue and the under parts paler than in the male. Young birds not long out of the nest are grayish with a tinge of blue in the wings, the upper parts are streaked with whitish and the breast is spotted with brown. They are sometimes confused with other species. For a considerable period after they have left the nest and are able to fly the young birds are solicitously attended and fed by the parents. This is particularly true of the broods coming out later in the summer.

WARBLERS, GNATCATCHERS, KINGLETS: FAMILY SYLVIIDAE.

Eastern Ruby-crowned Kinglet. *Corthylio calendula calendula* (Linnaeus).

This small, able songster seems to be a fairly common and generally distributed migrant in the Oneida Lake region. My latest spring date is May 14, when it was seen in a beech-maple-hemlock woods one-half mile southwest of Clay. During both seasons here our lists of May 1 include this species which may be expected in the region about April 10. Toward the end of September the bird comes back from the North and passes on southward a month later.

The ruby-crowned kinglet seems to choose no particular type of habitat here, but is found alike in mixed and deciduous woods, maple-elm-cedar bogs, about orchards and shade trees and in the shrubbery of cultivated as well as wild situations. On bright spring mornings it is more likely to be heard than seen. Its song is of extraordinary richness and complexity and "is one of the sweetest among our native birds." (Eaton, 1914, p. 512.) Chapman (1914, p. 490) describes it as "mellow and flute-like, and loud enough to be heard several hundred yards; an intricate warble past imitation or description." Many times I have sat beneath a bush or tree occupied by this songster and marvelled at its vocal ability.

Ruby-crowns are often found in low bushes along the lake shore, in woodland margins and in the woods proper. Seldom are they found in entirely open situations. While not strictly gregarious, I have often seen several individuals

moving more or less in company in such localities as the Short Point and Hitchcock Point districts and the lake shore in the Lower South Bay and Shackelton Point districts. In Iowa and other places I have often observed this species in company with its congener, the golden-crowned kinglet, but I have not seen the latter species in the Oneida Lake region during my two seasons' field work there.

These kinglets are very active in their habits, flitting about rapidly from branch to branch and from tree to tree. I have even seen the birds *hover*—after the fashion of a hummingbird, but with greater apparent effort—as they fed on insects or on hemlock buds.

On May 1, 1929, near a dwelling house at Lower South Bay, several ruby-crowned kinglets were flying about a small group of plum trees that were in full bloom. On looking more closely into the cause of their keen interest I found large numbers of honey bees and other smaller insects about the fragrant blossoms. The kinglets were feeding upon the smaller insects and the sharp snap of their mandibles could be heard plainly as they seized their prey.

Small insects form the major portion of the diet of this bird. Regarding its food habits in general, Beal (1912, p. 33) makes the following statement: "Its vegetable food contains no useful elements and its small size, which precludes the possibility of doing much harm to the products of industry, just fits it to cope with those minute pests against which man often finds himself so powerless." Eaton (1914, p. 508) makes a more specific reference to the insect-eating propensities of the ruby-crowned kinglet; he says: "I have also watched a ruby-crowned kinglet during the spring migration swallow 137 scale insects in two minutes from the branch of a garden tree which was afflicted by these pests."

The bright ruby patch in the center of the crown of the male is lacking in the female. While they are migrating and particularly while singing, the males seem to take delight in alternately concealing and exposing this brilliant patch. This is accomplished by the subcutaneous muscles which move the feathers of the head. Eaton (*loc. cit.*, p. 512) thinks that this bright crown patch not only serves to charm a prospective mate but also to frighten his rivals.

WAGTAILS AND PIPITS: FAMILY MOTACILLIDAE

American Pipit. *Anthus spinoletta rubescens* (Tunstall).

Although this inhabitant of the fields was not included in our 1928 bird list for the Oneida Lake region, we saw it on several occasions during the early part of the 1929 season. My first view of the pipit here was on May 3, when, in a low grassy field between Chittenango Creek and an adjoining maple woods, I discovered five of the birds feeding. As I approached them they walked rapidly ahead of me for a short distance, then stopped suddenly and began the characteristic wagging or flirting of the tail as I came on. When I got a little nearer they flew away with an easy, undulating flight and uttering a low "dee-dee—dee-dee" mounted high into the air, then circled about and alighted again near the spot they had just left. Two or three times this same thing happened before they finally flew out of sight.

On May 8, I came upon a single individual in a high grassy field in the Shackelton Point district. And on May 9 we saw several pipits in company with prairie horned larks a half-mile north of Hall Island, Cicero Swamp district. On this last occasion the birds were working back and forth from newly plowed ground to an adjoining low grassy field. When flushed these pipits did not circle about to return to the starting point in the manner characteristic of the species, but kept well ahead of us by making short, low, direct flights. A little later a single bird passed over me, exhibiting the usual undulatory, airy type of flight, uttering its characteristic note as it flew.

The pipit is an abundant migrant in some parts of New York State. During the autumnal migration it is more plentiful and more generally distributed than during the spring movement when its occurrence is more local; in the spring, too, it is much less likely to be found in the interior districts. However, the low open fields in the Oneida Lake region offer a favorite type of feeding ground for the bird and it is probably a fairly regular though never abundant species here. In spring it may be expected between April 1 and May 15; and in the autumn, any time during September.

For the most part, the pipit breeds within the Arctic zone and winters from southern Ohio and New Jersey southward to the Gulf Coast and Guatemala. In central Florida I have seen it in numbers during the winter months. At Sanford, Florida, where a great area is planted to celery, this bird visits the fields in flocks varying in size from thirty to 400 individuals and is a potent factor in holding in check certain noxious insects that feed on the celery.

The pipit prefers large, open coastal flats; but in the interior, old fields, meadows and pastures are its favorite haunts. In the territory about Oneida Lake, the spring-plowed fields and open meadows are their chief resorts in their northward journey.

The pipit is a highly terrestrial and more or less gregarious bird which closely resembles some of the sparrows, but from which it may be distinguished by its long, slender bill and its habit of walking instead of hopping. It is rather unsuspicious and will ordinarily permit of close approach.

Studies of the stomach contents of 284 pipits taken in every month of the year from twenty-six states, the District of Columbia and Canada have been made by Gabrielson (1924, pp. 27-32). His findings show that about eighty-five per cent of the food is made up of animal matter. Of this, insects comprise seventy-seven per cent, including beetles, caterpillars, Hymenoptera, true bugs, grasshoppers and crickets and two-winged flies.

A little more than fifteen per cent of the pipit's food consisted of vegetable matter of which seeds of various grasses constituted the bulk. Some grain from stubble fields also enters in.

From an economic viewpoint it is probable that the pipit exerts its greatest influence for good during the winter months when it feeds upon many insects harmful to agriculture in southern United States.

WAXWINGS: FAMILY BOMBYCILLIDAE

Cedar Waxwing. *Bombycilla cedrorum* Vieillot.

In the Oneida Lake territory the cedar waxwing, sometimes called cedar-bird or cherry-bird, is a common summer resident. It nests in the trees bordering the outlying streams, ponds and lakes, as well as in the shade trees and orchards about human habitations. It even invades some of the villages about the lake, before, during and after the nesting season.

It is a bird of gregarious habits, is unsuspicious, and has no song but utters a high pitched, lisping trill, "tse-tse-tse."

Here, as in most other places in the State, the bird occurs regularly and is generally distributed throughout the summer, but in winter it appears sporadically, wandering about in flocks, its presence in a given locality being largely dependent upon the abundance of food.

In May, during both our seasons in this territory, the cedar waxwing was not common. In the 1928 season I did not see it before May 28; and May 21 in the following season. Apparently it does not appear here in any numbers before warm weather sets in. Then it appears in flocks numbering from two or three to fifteen or twenty individuals. It seems to prefer the tall trees in the vicinity of water. I have records of the species during the month from Hitchcock Point, Shackelton Point, Gordon Pond and the Cleveland and Constantia districts. At the last mentioned place on May 21, 1929, I saw a flock of fifteen feeding on buds of apple trees in an orchard. This was the largest flock noted during the month.

By June 1, the waxwing has become much commoner and flocks numbering from six to as many as thirty individuals are frequently seen. In their flights a close order is maintained and sometimes a large flock will suddenly wheel, the members behaving as a unit and, darting downward, alight as a group in the top of a tree, whence thereupon a chorus of low, tremulous whistles soon proceeds. Often they remain practically motionless for a spell while they assume an erect posture and elevate and depress the elongated feathers of the crest. Presently they begin to feed or with a chorus of lisps are off again as a unit to another part.

Gradually the waxwings become more plentiful and generally dispersed, but as the season advances they seem to congregate more in the territory lying to the north of Oneida Lake where, according to our observations, the species breeds and occurs more commonly than in the territory immediately to the south of it.

Not only the hardwoods along the lake shore but also the vicinity of farm buildings and even the villages now come to be favorite gathering places of these loitering, lisping birds. The Kibby and Panther Lake districts, the Gordon Pond and Vandercamp woodlands and adjoining wooded sections in the Constantia, Cleveland and other north-side districts appear to be their main strongholds although they occur more or less generally also in the Bridgeport, Lakeport, Lower South Bay and other south-side localities.

In the breeding season, too, certain unique and interesting modes of behavior toward one another are exhibited by these birds. Various displays of apparent affection are sometimes manifested such as touching the tips of their bills together

and preening each other's plumage. In human affairs, I suppose that similar actions might be construed as a form of "petting." I have at times seen one adult feed another with the greatest apparent affection and concern. For example, on June 1, 1929, in an alder thicket near Jewell, an adult alighted on the limb of a tree close to another bird and deliberately passed food to it two or three times from the content of its own bill, then flew away. This performance has been witnessed on other occasions—by both Mrs. Stoner and myself. The seeming solicitude which these creatures exhibit toward one another is one of their most interesting traits.

While during early June the flocks of cedar waxwings have become larger and the species more generally distributed, sometimes even entering the deep hemlock growths such as the Widrig and certain parts of the Vandercamp woods, evidence of the breaking up of the flocks becomes apparent toward the end of the month and the birds are then most frequently seen in pairs. The tracts of high hardwoods and the vicinity of orchards, roadsides and villages become its favorite resorts. Sparsely wooded sections near open fields seem to appeal to it most. However, from about June 20 and through July, family cares largely occupy the attention of the waxwings and they are not so much in evidence.

In late July and early August the species again becomes conspicuous by its abundance. Both adults and young of the year congregate in numbers, as in the case of other birds previously mentioned, in the blueberry and pin cherry thickets to feed on these and other wild fruits.

The cedar waxwing is a late nester, seldom getting started before mid-June. During courtship the birds often perform various antics, bowing, billing and caressing each other and otherwise displaying their affection and admiration.

On June 11, 1929, just east of the Catholic Cemetery at Cleveland, I saw an individual with waxy tips on its secondaries, picking up nesting material about a grapevine at the rear of a dwelling house. After selecting several pieces of material and successively dropping them it finally deliberately and solemnly "chose" a stalk of dried grass and flew away with it. On June 19, 1928, another waxwing was observed carrying nest material. On June 21, 1924, I saw waxwings mating. My earliest record of an incubating bird is June 27, 1928, when I discovered a nest forty feet up in a maple tree near Jewell.

Usually the nests of the cedar waxwing are crude bulky affairs made up of a variety of materials easily available. Around human habitations it utilizes such things as rags, string, paper and the like. Twigs, weed stems, strips of bark, plant fibers, leaves and rootlets comprise the ordinary materials while a lining of plant down, horsehair or wool is usually provided. The nest is usually placed from five to forty feet above the ground in orchard, shade or forest trees, either deciduous or coniferous, although I believe that deciduous trees are preferred. So far as my experience in the Oneida Lake region is concerned, the bird often selects a roadside maple tree or a willow tree near water in which to nest.

Four or five bluish or yellowish gray eggs heavily spotted with blackish and brownish, comprise the usual clutch. The incubation period is said by Burns (1915, p. 286) to be ten or twelve days; both sexes take part in incubation as well as in the construction of the nest.

It is altogether likely that two broods are reared here in a season, for young birds out of the nest not more than from three to five days were observed in the Jewell district on July 28, 1928, while on the same date, nestlings not more than two or three days old were discovered. The nest containing these four young birds, together with an infertile egg was about thirty feet up in a willow tree situated in a pasture, about two miles southwest of Fish Creek Landing. This willow was one of several scattered deciduous trees on the low flat bordering Fish Creek. Upon examination of a pellet of excrement in the nest I found that it contained seeds of the blueberry; evidently the insect fare of the young is well mixed with fruits of various kinds. At this season of the year blueberries are particularly plentiful in the region. I banded these young several days later.

When hatched, young waxwings are naked, lacking the natal down so characteristic of most birds. Their bodies are blackish, and for the first few days they grow in size only; it is not until the fourth or fifth day that the first external signs of feather growth appear. According to Saunders (1911, p. 327), the young leave the nest in about fourteen to eighteen days after hatching.

The fondness of the cedar waxwing for cherries has given rise to one of its popular names, and because of the depredations of the bird in cherry orchards a good deal of complaint has been raised against it. At times, too, it destroys the buds and flowers of fruit trees. Most of the damage to cherries is done to the early varieties before the wild fruits have ripened; cherry trees on which the fruit ripens later are not so likely to be visited by these birds.

Studies of the stomach contents of 152 cedar waxwings made and reported upon by the late Professor F. L. Beal (1897, pp. 31-32), show that vegetable matter constituted eighty-seven per cent of its food. Of this, cultivated cherries formed but five per cent of the yearly diet; remains of this fruit were found in only nine of the forty-one stomachs collected in June and July, when most cherry trees are fruiting. Other, possibly cultivated, fruit consisting mostly of raspberries and blackberries, made up eight per cent. The remaining vegetable food—seventy-four per cent—consisted of wild fruit or seeds. Such fruits as juneberries, cedar berries, wild cherries of various species, blueberries, elderberries and service berries are much favored.

Animal matter comprised thirteen per cent of the food. Various destructive beetles, ants, caterpillars, cicadas, scale insects, grasshoppers, mayflies, dragonflies and other insects made up the bulk of this, while spiders and a few snails comprised the principal remaining items.

At times the cedar waxwing behaves much like a flycatcher in its manner of securing insects. On several occasions I have watched a waxwing dart out from a top limb to seize a flying insect, then return to the same perch and await the next opportunity. I have noted the birds performing thus in May, June and July. A field note under date of July 16, 1928, relates to this and other habits of the bird.

"I watched one individual that was perched on the limb of a tall dead tree launch out after a flying insect and return to the same or an adjacent branch after the capture was made. The performance was repeated several times. I

saw other individuals engaged in the same manner here today, and at Shackelton Point on May 31.

"Fairly common in the open bushy woods south of the West Monroe Cemetery. I think it is nesting in the sparsely distributed tall trees which grow among the tangle of red raspberry stalks at the edge of the woods. The fruit of these shrubs makes up a part of the bill of fare of these birds."

McAtee (1926, p. 68) sums up the status of the cedar waxwing as follows: "Although ordinarily it may not be highly useful, at times evidently it attacks some pests in a wholesale way. Then, just as it is able to do much harm by feeding in flocks on buds or fruit, it is able to do much by massed attack on some destructive insect." In general, this bird is a beneficial species and whatever it may lack from the viewpoint of the horticulturist is in some measure compensated by its pleasing appearance and its sociable and demure manner.

Upper parts grayish brown; forehead, chin and line through eye black; head conspicuously crested; tips of secondaries often with small, flattened scarlet, wax-like appendages; tail with a uniform terminal yellow band. Under parts grayish brown changing to yellowish on the belly. Immature birds are streaked below.

SHRIKES: FAMILY LANIIDAE

Migrant Shrike. *Lanius ludovicianus migrans* Palmer.

Our observations lead us to think that the migrant shrike is a rare summer resident in the Oneida Lake region. In the two seasons' work but a single individual has been met with and that on June 15, 1928, when one was seen by Mrs. Stoner on a roadside telephone wire one-half mile west of West Monroe. The bird flew from that perch into the highway where it appeared to pick up some object, then flew away to an adjoining open field.

Eaton (1910, sec. 4) records the migrant shrike as breeding in all four counties immediately surrounding Oneida Lake, and possibly it may be better represented in the less swampy districts farther from the lake than in those where most of our observations were made. Apparently this is one of the species that has increased in numbers in the interior of the State during the past fifty years, but the Oneida Lake region does not seem to be one of its strongholds.

Spring arrivals may be looked for late in March or early in April, while the southward movement to the winter quarters in the Middle and Gulf states usually takes place in October.

Open fields and fence rows, with a tall tree here and there is the type of habitat usually selected by this predacious passerine bird. The top of a dead tree or a fence post or a roadside telephone wire are favorite points of vantage from which the "butcher-bird" scans the surrounding territory, seeking its prey—a field mouse, grasshopper, snake, frog or some small bird. Suitable shrike habitat is not lacking and one would expect to find this species better represented than our single record indicates.

This black and white bird is notable among our species for its habit of impaling its prey upon barbed wire fences, or the thorns of the hawthorn which commonly occurs in waste places along fence rows, old pastures and elsewhere.

While it takes a smaller song bird occasionally, its habit of feeding upon the larger insects, of which grasshoppers form a considerable proportion, entitle it to be ranked as a helpful species. Why this bird is not more plentiful in the Oneida Lake territory I am at a loss to explain.

The nest of this shrike is commonly placed in an apple tree or thorn bush and at a height of five to twenty feet from the ground. Farming communities are preferred to wooded sections. A miscellaneous lot of materials such as sticks, weed stems, grasses, leaves, bark, rags, feathers and rootlets usually enter into the construction of the nest. The four to eight eggs, whitish and variously marked with brownish or olive, are ordinarily deposited late in April or early in May.

The incubation period is said (Burns, 1915, p. 286) to vary from thirteen to sixteen days. Most of the incubation is performed by the female. Despite the good-sized clutch of eggs and the possibility that two broods may be reared in a season this species does not seem to increase in numbers markedly.

In the field, at some seasons, the migrant shrike is difficult to distinguish from the northern shrike and at all times from the loggerhead shrike. Upper parts slaty gray, with white markings on blackish wings and tail. A wide black stripe from bill through eye. Bill entirely black below. Under parts plain gray, paler on throat and sides of head.

STARLINGS: FAMILY STURNIDAE

Starling. *Sturnus vulgaris vulgaris* Linnaeus.

While several earlier attempts were made to introduce the starling into the United States, the permanent establishment of the species in North America seems to date from April, 1890, when eighty birds were released in Central Park, New York City. Just why this or the preceding attempts at introducing this bird were made is not known, but the following year eighty more birds were released. That success has attended these introductions is indicated by the vast numbers of individuals which now inhabit the continent from Ontario to the Gulf of Mexico and from Nova Scotia to Iowa, Kansas and Missouri; all have sprung from these releases of 1890 and 1891, and from the nation's metropolis the dispersal has been gradual.

In the Oneida Lake area the starling is a common permanent resident. This species, the English sparrow and the robin are three of the most persistent rearers of young among the local bird population. The statements of residents of this territory confirm my own observations of two seasons that the starling is steadily increasing in numbers here. The general distribution of the species also is a matter of comment for it occurs alike in the open country and about farm houses, villages and towns of the region. It appears to be as abundant in the north-side territory as elsewhere, but avoids the heavily wooded sections. It occurs on both Frenchman and Dunham islands, but it is commoner on the former where I found young in the nest on May 25.

The starling is a trimly built bird with a short tail and a long bill that is somewhat flattened at the base. It is highly terrestrial and spends much time walking with quick, nervous steps in a more or less erratic course over lawns in towns,

villages and country homes and about meadows and grassy fields. It is highly gregarious.

In flight the anterior end of the body appears to be carried somewhat higher than the posterior part; flapping and sailing alternate. The concerted movements of a flock of starlings on the wing remind one of a group of semipalmated sandpipers.

This bird utters a variety of calls and whistles and has no small ability as an imitator. I have heard it imitate with a considerable degree of fidelity the wood pewee, the bob-white, the English sparrow, the bronzed grackle, the field sparrow and the flicker. The bird also produces a series of harsh, rasping and more or less guttural notes, and the males are no mean songsters. Flocking starlings sometimes chatter in chorus. A harsh grating call is given by the young while in the nest and is continued for some time after the birds have learned to shift for themselves.

The hardiness and adaptibility of the starling in meeting new situations are in some measure responsible for its success in this country.

The starling breeds generally in the Oneida Lake region. Old apple orchards, so common all about the lake but particularly on the south side, are its favorite nesting places. The birds nest either in natural cavities or in old woodpecker holes. Maple and other trees about buildings, as well as the buildings themselves are often chosen as nesting places, and the cornices of barns and houses are common nesting sites, besides ventilators on the roofs of barns, spaces between doors, beams and the like. Even martin houses and nesting boxes intended for bluebirds and flickers are usurped by these energetic and prolific birds.

The nest is a bulky affair constructed principally of grass or straw with sometimes a few twigs or corn husks and a lining of feathers or moss or green leaves. It may be placed at heights varying from ten feet to twenty-five or thirty feet above the ground, but I have seen them as low as four feet and as high as sixty feet. Nests in trees vary in height from five to thirty feet from the ground.

From three to six pale bluish eggs comprise a clutch. Incubation is performed by both sexes and requires about twelve days. The young do not leave the nest until they can fly—fourteen to twenty days, ordinarily—so that the mortality among the young is thereby reduced in this species. No doubt this factor contributes materially to the success of the starling.

The food of nestling starlings consists almost entirely of insects, such destructive forms as weevils, May beetles, grasshoppers, crickets and caterpillars making up a large share of their diet. Therefore during the period in particular when young are in the nest, the starling is a highly beneficial bird.

While we have at hand many records of the nesting of the starling in the Oneida Lake region, from May 1 to August 6, it is not necessary to set forth all these data in order to give a concrete idea of the breeding status of the species here. A few of the more important and significant items have, however, been selected from my field notes and are given in chronological order by months.

"April 30, 1928. Lower South Bay district. A few small groups, but the wintering flocks have decreased materially in size; many nesting sites have been

selected, others are now being sought; some individuals are mating; saw one carrying nest material.

"May 1, 1929. Lower South Bay district. Starling seems to be commoner than last season. Numbers of adults carrying food for young. One nest in large maple tree, about fifteen feet from ground, where limb had been cut off and decay had set in, making excavation easy. Another nest in an old hollow apple tree in an orchard. Saw one bird carrying nest material.

"May 3, 1929. Lower South Bay district. A pair nesting in a martin house at residence of Mrs. Katherine Van Antwerp. Incubating now. (The young hatched May 5).

"May 5, 1929. A pair nesting in a hole under the eaves of the club house of the Syracuse Yacht and Country Club at Lower South Bay.

"May 7, 1929. Unquestionably the starling is commoner and more general in the region than last year. Every old orchard harbors at least a pair or two. Many adults carrying food for young in nest now. Others are carrying nest material of straw and grass.

"May 13, 1929. At Bridgeport, found young out of the nest. This is my earliest record for birds in this stage of development. Starlings nest freely in the village, particularly about an old barn and mill along the banks of Chittenango Creek.

"May 21, 1929. Very common, and numbers of nests in an old apple orchard just west of Constantia. Young now well developed.

"May 22, 1929. Good many young now out of nest. They have begun to gather in flocks in the meadows in the Cleveland district. At Shaw point saw a bird carrying nest material; this must be in anticipation of a second brood.

"May 29, 1928. Shaw Bay district. Starlings abundant here; nearly every flying bird is now carrying food for young. This seems to be the height of the period when the young require most attention.

"June 7, 1928. Many young starlings out of nest now; I notice some tendency for the young birds to flock. Saw an adult feeding a young one that had been out of the nest for several days and was able to fly well.

"June 8, 1929. Cleveland district. Great numbers of young now out of nest and collected in flocks in open roadside fields and about farm buildings. The species is commoner in the more populous communities than in the less populous ones in the Elpis and Maple Flats districts.

"June 13, 1928. Cleveland district. Very common; many young of the year in both wooded and open districts. Adults feeding young; the hoarse, rasping cries of the latter are heard on all hands.

"June 17, 1929. Flocks of young birds near Coble Point; but the species is not as common on the south side of Oneida Lake as it is on higher ground in the vicinity of Cleveland, Constantia and Jewell.

"June 21, 1929. Lower South Bay district. Saw a flock of one hundred or more birds of the year following a herd of cattle that was grazing in a pasture. The birds were feeding on insects, but whether these were insects which had been disturbed by the movements of the cattle or had been attracted by the cattle, I do not know. However, it was clear that the starlings were accountable for the

destruction of large numbers of the insects and were following the cattle closely and persistently in their search for this food.

"June 22, 1928. Very common, Shaw Point district. Great numbers of young out of the nest here. Apparently the members of a family keep together for a few days after the young leave the nest, for many groups of five to fifteen immature birds are to be seen. Very likely these are representatives of two or three families reared in close proximity to one another. The young birds that are out of the nest are very noisy now and their harsh, grating food calls are a common sound.

"June 24, 1929. The starling is common all through the flat district south of Bridgeport and Lakeport. Found a nest six feet from the ground in an old woodpecker hole in the dead limb of an apple tree at an abandoned farm house three miles southwest of Bridgeport. This nest cavity was about a foot in depth. The three nestlings were about eight days old, and undoubtedly were a second brood.

"June 27, 1929. Oak Orchard district. Found numbers of young of the year, and a few adults, on plowed and newly disked fields. However, most of the adults in the region are now busy rearing a second brood of young. A good many are carrying food for young.

"These flocks of birds of the year that visit newly cultivated fields must be of considerable value in reducing the numbers of insects there and on the adjoining land.

"June 29, 1928. Cleveland district. Flocks of young birds of about fifteen to forty or more individuals are now common. Near Jewell I saw a flock of more than sixty, mostly young birds. The flocking of the young is a conspicuous activity here now. Also observed an adult bird carrying nest material. This is certainly for a second brood.

"June 29, 1929. Adult feeding well fledged young in nest at ice house on east side of Chittenango Creek, near its mouth.

"July 9, 1929. Numerous small roadside flocks in Clay and Oak Orchard districts.

"July 11, 1928. At Cicero Swamp southwest of Clay I saw a flock of about fifty young of the year flying over.

"At Mr. A. J. Pattat's residence, Lower South Bay, young about ready to leave the nest are in the upper compartment of a martin house. A family of purple martins is being reared in an adjoining compartment of the same story while several other families of martins occupy other space in this nesting box. The martins and starlings appear to get on amicably in these intimate associations.

"July 13, 1928. Bridgeport. Saw a starling carrying nest material. Breeding seems to be a continuous performance with these birds throughout the summer. Nest construction at this date would seem to mean preparation for a third brood.

"July 15, 1929. Near Lakeport at 4:45 o'clock this morning I saw a flock of starlings made up mostly of young of the year, that I estimated to contain about five hundred birds. This is the largest flock that I have seen here and supports my belief that the species is commoner here now than last season. The birds were heading toward the open fields south of Oneida Lake.

"July 17, 1928. Young starlings of the year to be seen everywhere, but mostly in flocks now. Sometimes mixed flocks of red-winged blackbirds or bronzed grackles and starlings occur.

"At the Cicero Swamp, between 6:30 and 7:15 p.m., flocks of starlings of ten to fifty or more birds flew over intermittently. These flights proceeded consistently in a northwesterly direction, probably to some roosting place. The noise—a kind of *swish*—made by the wings of such a flight of birds is considerable. Contrary to the habit of grackles and red-wings, the starlings seldom give voice during these flights. During our stay I estimated that more than two thousand starlings flew over us, all moving in a definite, northwesterly direction. The flight was practically over by 7:15 o'clock.

"July 24, 1928. Lower South Bay district. Starlings carrying nest material. A pair building a nest in the cornice of an old occupied house at the golf grounds of the Syracuse Yacht and Country Club. Entrance to the nest cavity is gained through an opening in the cornice that was left when the drain pipe was removed.

"August 2, 1928. Cleveland district. Flocks and squads of young everywhere. Saw an adult carrying food evidently for young in the nest.

"August 6, 1929. Bridgeport district. Adult carrying food."

Toward the close of July and through August the starlings become especially conspicuous by assembling in large feeding flocks. These are made up not only of birds of the year, but also by an increasing number of adult birds as the breeding season comes to a close and family duties cease for the season. Open fields, particularly cut-over hay fields, are visited frequently by the birds in every section. Grasshoppers are very abundant in such situations and, I suspect, now form a large item of food of the starlings. Sometimes red-wings and grackles join the company. Flocks numbering from fifty to two hundred fifty starlings are not uncommon. They are wary and fly away in a compact body when one approaches them. At this season, too, these birds congregate in numbers about feeding or resting cattle, at times walking unconcernedly over the backs and heads of these creatures, apparently feeding on insects. The beneficial qualities of the starlings as insect destroyers are apparent here throughout the summer. In late July I have, however, observed both the red-wings and the starlings feeding on the heads of uncut ripening oats, so possibly a certain amount of harm is thus done, but its extent is unknown.

Only one local complaint of damage to fruit caused by the starling was reported to me. A gentleman in the Lower South Bay district charged that the bird caused a good deal of injury to apples "just as they are turning red." No doubt also some damage is done by the bird to the local cherry crop, although nothing of the sort was brought to my attention.

In its relations with other birds the starling is more or less antagonistic, particularly when a nesting site is in dispute. Bluebirds, flickers, purple martins, house wrens, English sparrows and robins are among the species coming most into conflict with this resourceful bird.

Mr. Herbert Walker, a farmer living near Fish Creek Landing, found that a pair of starlings had destroyed the eggs of a flicker, the nest of which was in a hollow maple tree in his yard. After he had shot more than two dozen of the

starlings about his place, the same or a different pair of flickers successfully reared a family of young.

Mrs. Charles J. Niles who lives on a farm two miles southwest of South Bay told me that the starlings drive away the native birds from her dooryard, and that she had seen the starlings even attack young birds in the nest and carry them away.

Mr. William Parker, who lives about one and one-half miles southwest of Lakeport, says that in many places the starling has driven away the English sparrows from the vicinity of barns and other buildings. With the dispersal of the sparrows the barn and cliff swallows, more desirable birds than either the sparrows or the starlings, have come in. Swallows will not build where sparrows congregate in any numbers, but starlings and swallows seem to get on without much conflict.

These statements are substantiated by my own experience here. However, as noted above under date of July 11, the starling and the purple martin will sometimes nest side by side without hostilities.

The starling is a native of western and central Europe where, in general, its economic status is favorable. However, with the increase in numbers of the bird in this country, because of its flocking habits and its tendency to visit agricultural and horticultural sections in large numbers, the food habits of the species in its new surroundings became a subject of interest and some controversy. Accordingly, the U. S. Bureau of Biological Survey conducted an investigation regarding the economic relations of the starling in this country. Messrs. E. R. Kalmbach and I. N. Gabrielson were assigned to this task and the results of their findings were published in 1921. (U. S. Dept. Agric., Bull. No. 868, pp. 1-66.)

An examination of 2,157 stomachs of adult starlings showed that animal food comprised fifty-seven per cent of the yearly diet. Insects, many of which are very destructive, comprised about forty-two per cent of the animal matter taken, while the remainder consisted principally of millipeds, spiders and mollusks. The forty-three per cent of vegetable material consisted largely of wild fruits (23.86%), of which mulberries, juneberries, choke cherries, black cherries, elderberries and Virginia creeper made up a conspicuous part. Cultivated products such as corn, apples, cherries, berries, and grapes constituted the bulk of the remaining nineteen per cent.

By way of summarizing the status of the starling it may be said that on the whole its food habits are either neutral or largely beneficial, so far as man is concerned, for it destroys great numbers of noxious insects. The diet of the young birds in the nest—which far outnumber the adults during the summer, because of the number of broods—consists almost wholly of insects. But the adults, too, are highly insectivorous for a considerable part of the year.

On the other hand its destruction of cultivated fruit, corn and other crops, its belligerent attitude toward some desirable birds, its tendency to congregate in large flocks and its fecundity are factors decidedly against the bird.

It is possible that local control measures may be desirable or necessary in some situations, but a general widespread slaughter of the bird throughout its range is not justified at the present time.

Methods of combating the starling where conditions warrant are to be found in Farmers' Bulletin No. 1571, U. S. Department of Agriculture, which was issued in December, 1928.

Summer adults: General coloration shining purplish or greenish black; feathers of upper parts tipped lightly with pale buff; feathers of under parts marked only on sides. Tail short. Bill yellow.

Winter adults: Similar to summer plumage, but upper parts heavily spotted with cream buff, the under parts spotted with white. The entire bird has a speckled appearance. Bill blackish brown.

Immature in summer: Plumage dark grayish to brown similar to that of a female cowbird, but bill longer and tail shorter.

VIREOS: FAMILY VIREONIDAE

Yellow-throated Vireo. *Vireo flavifrons* Vieillot.

The yellow-throated vireo is a fairly common summer resident in the Oneida Lake region. It occurs more frequently in the vicinity of the habitations and activities of man than in the densely wooded, isolated sections usually chosen by the solitary and, to some extent also by the red-eyed vireo. It is exceeded here in numbers by both the red-eyed and the warbling vireo.

My earliest spring date for the yellow-throated vireo is May 10; doubtless a few individuals reach the region perhaps a week earlier. It seems to be more widely dispersed in early spring than later when its local distribution becomes more restricted, being then confined largely to orchards and groves, the vicinity of cottages and summer camps, tall roadside trees and those in the villages about the lake. I have been particularly impressed by the numbers of yellow-throated vireos about the villages of Bridgeport and Cleveland during the summer. Wooded tracts composed largely or solely of tall maples, wild black cherry and other hardwoods such as those in the Short Point, Sylvan Beach, Hitchcock Point and Shackelton Point districts also appeal to this vireo. It was found on Dunham Island on May 25, and I suspect that it nests there. This is one of the birds that seems to be commoner on the south side of the lake than on the north side. In September it departs for its winter home in Mexico and Central America.

This bird for the most part frequents the tops and foliage of the taller trees, particularly during the nesting season. However, during May and later in the season as well, it not infrequently resorts to the lower branches of shade and orchard trees to feed and sing. Its song has the characteristic jerky peculiarity common to the vireos, but it is deeper—Chapman (1914, p. 427) calls it a contralto—and is uttered in deliberate fashion with a somewhat different accent and tempo than that of the red-eye. It seems to be made up of three parts, each of which is uttered rapidly, but often a considerable pause or rest intervenes between them. Chapman (*loc. cit.*) has interpreted this music into "See me; I'm here; where are you?" Usually the singer occupies the outer end

of a branch well up in a tall tree while vocalizing, and his song is frequently heard some time before he himself is discovered. These vocal efforts continue into mid-August with no appreciable diminution in volume or change in tone, but with considerable reduction in the frequency with which they are given; the length of the singing periods is also much curtailed at this season. This vireo ranks next to the red-eye in persistence in displaying his vocal powers, and he is likely to be moved to the effort at almost any time of day.

A common nesting habitat of the yellow-throated vireo here is an old orchard, a roadside maple or a cottonwood or a hickory or other hardwood tree in the vicinity of a lakeside summer camp. The pensile nest is composed of plant fibres, grasses and pieces of bark and is decorated externally with lichens and spiders' silk and hangs fifteen to thirty feet from the ground. Such a nest I found at Baker Point, twenty feet up in a large shag-bark hickory tree which stood fifteen yards from the lake shore. The nest was on a large limb at the tip of a very small twig that was so flexible as to allow the nest to swing freely in the breeze, with some danger of catapulting to earth the four fledglings which occupied it on July 30. If all went well with these young birds they would have left the nest in three or four days; they were banded as Nos. 97998A, 97999A, 98000A and 46401B. While I was thus engaged the adult approached and uttered a series of harsh chirps as it viewed the intruder upon its domain.

On July 11, in an old orchard near the Pattat residence at Lower South Bay, adults were carrying food (insect larvae) to young, and three days later parents were noted here feeding young that were out of the nest. These records indicate that eggs may be deposited from late May until early July.

According to McAtee (1926, pp. 73-74), more than ninety-five per cent of the animal food of the yellow-throated vireo is made up of insects most of which are destructive to trees. Among these forms are caterpillars, moths, cicadas, leaf hoppers, plant lice, scale insects, leaf chafers, wood borers, twig girdlers and nut weevils. Spiders also are taken in numbers. Only a slight amount of vegetable substance in the way of wild fruits is taken. A bird with such dietary tendencies and which is as common as this vireo is in the Oneida Lake region can not help having a beneficial effect so far as trees and other larger vegetation is concerned. It is a desirable bird in every respect.

This vireo may be readily distinguished by its bright yellow throat and breast, white belly, yellow eye-ring and two distinct white wing bars.

Blue-headed Vireo. *Vireo solitarius solitarius* (Wilson).

Although this vireo is said to be a fairly common migrant in most portions of the State I did not find it in the Oneida Lake region in the 1928 season until June 25, when one singing in the fairly dense hemlock portion of the Vander-camp woods attracted my attention. I saw the same or another individual here on July 26.

But undoubtedly the status of the bird here varies somewhat from year to year. On my first field trip, May 1, 1929, I saw a blue-headed vireo in a maple grove in the Short Point district and I also found the species at subsequent times in other localities and under circumstances that lead me to believe that it

breeds sparingly in the region. The bird is likely to arrive late in April. By the third week in May most individuals have moved on into the Canadian zone, the typical breeding range; they return early in September and have left for their winter quarters in our Southern States and Central America by late October.

In addition to the 1929 record above mentioned, I saw the blue-headed vireo during that season at the following places about Oneida Lake:

"May 11; near mouth of Chittenango Creek; low trees, edge of elm-maple woods; one bird.

"May 17, and 23 and July 23; Vandercamp woods, F. C. Soule estate; same spot where bird was seen in 1928. Moderately dense hemlock-maple-birch-beech woods with a fair undergrowth of saplings; a small brook meanders through this part of the woodland and the bird was always found near it.

"June 4; deep hemlock-birch-maple-beech woods three miles northwest of Cleveland. This woods, in the wilder and sparsely populated 'back country', is seldom visited by people during the summer. The species probably breeds here. One bird seen.

"June 10; heavy hemlock-beech-maple-birch woods four miles north of Cleveland; one bird singing gayly and vigorously.

"July 24; heavy, little frequented, mixed maple-white pine-birch woods four and a half miles northeast of Jewell and one and a half miles south of Thompson Cleveland; one bird singing gayly and vigorously.

"July 26; Widrig woods, two miles northeast of Cleveland; deep thick hemlock growth; one bird; singing."

It is evident, therefore, that the blue-headed or solitary vireo occurs sparingly in the Oneida Lake region and that a few remain to breed in the deeper and more isolated portions of the hilly mixed woodlands on the north side of the lake.

This bird is somewhat of a recluse, usually found in quiet out-of-the-way parts of wooded areas. It has a habit of keeping well hidden either in the foliage toward the tops of the trees or in the semi-darkness of the dense lower branches. It does not appear to be as active as the red-eyed vireo and, in my experience, it exhibits a more quiet and unruffled manner than do our other common vireos. I have sat quietly and watched the bird as it sang and fed low down in the trees only a few yards from me. The observer is likely to hear the bird before he sees it.

The blue-headed vireo has a musical and pleasing song which, while it possesses a measure of the harshness and staccato-like accent so characteristic of most vireos, is a higher pitched, sweeter and less monotonous warble than that of the others. Between songs the bird often utters a delightful, low, melodious warbling whistle. While to my mind the song is most like that of the red-eyed vireo, it partakes in some measure of the rhythm of that of the yellow-throated vireo. I have more frequently observed the bird singing among the lower branches of trees and have often heard it singing as it fed. Evidently the vocal ability of this bird does not wane early in the season for it was singing as lustily as ever on July 24 and 26.

That the solitary or blue-headed vireo nests sparingly in the region can not be doubted, for the single bird observed on June 25 and July 26 in the 1928 season, at the same spot in the Vandercamp woods—an altogether likely looking nesting place—and the fact that on the latter date the bird was carrying food, afford strong evidence on this point. The June and July, 1929, observations support this conclusion.

The pensile nest of plant down, pine needles and plant fiber is said to be attached to the fork of a sapling or the horizontal limb of a small tree five to ten feet from the ground. Three or four eggs constitute the usual set.

Only a very small proportion of vegetable substance—mostly wild fruit—is included in the diet of the solitary vireo. On the other hand, the amount of insect food taken is proportionately large. Among the insects, caterpillars, true bugs, beetles, sawflies, gall wasps, ants and other Hymenoptera form a conspicuous share. Hairy caterpillars are not a favorite article of food with most birds, but in the Short Point district I saw one of these vireos swoop down from the lower limb of a small maple, seize such a caterpillar and beat it on the branch of the tree several times before devouring it. Most of the insects taken by this bird are destructive so far as man's interests are concerned and any diminution in their numbers aids his efforts in both field and forest.

The bluish gray top and sides of the head, white lores and eye-ring, two distinct white wing bars and white throat will serve to distinguish this species.

Red-eyed Vireo. *Vireo olivaceus* (Linnaeus).

This tireless and monotonous songster is a common summer resident in the groves and woodlands throughout the Oneida Lake region, where it is also the most abundant representative of the family. My earliest spring date for it is May 6, 1929, when several were noted in Sauers' woods south of the West Monroe Cemetery. No doubt the first arrivals put in their appearance a few days earlier. This vireo frequents the wooded districts where from early morning until late afternoon or evening its song is likely to be heard. It leaves for its winter home in South America in late September and in October.

An enumeration of the localities in which we have found the red-eyed vireo would include practically every woodlot visited, except some of the very deepest and densest hemlock tracts on the north side of Oneida Lake. It does occur, however, in dense mixed woods such as Emmons' woods, Vandercamp woods and Widrig woods, and in June I have heard it in the thicketed sections of the village of Cleveland. At that season, too, I have found it in dense alder thickets. In the Sylvan Beach district, as at other places, this is the commonest of the vireos. Woodland with an undergrowth of slender saplings from six to ten feet high seems to appeal to this bird most, and the mixed woods about two miles southwest of Lakeport and parts of the Parker woods in that vicinity, as well as the numerous other similar tracts distributed throughout the region offer their attractions to this bird. No doubt the abundance of suitable habitats is largely responsible for the success of this bird not only here but in general throughout the State. In contrast with the common habit of the yellow-throated and

warbling vireos, this bird sticks well to its chosen woodlots and does not often frequent the orchards and shade trees about farm houses and villages.

Like the other vireos, the red-eye feeds and sings in the trees. However, in my experience here it does not visit the tops of the highest trees so much as those of the lower that are somewhat shaded by their towering neighbors.

The clear and musical yet withal rather high-pitched and harsh song is given with monotonous persistence throughout even the hottest summer days when few other birds have the inclination to sing. The bird seems to lose little of its vocal powers or the inclination to use them until early in August when some diminution in volume and frequency of singing can be noted, and by mid-August the red-eye is as silent as most other birds. Often the bird sings as he peers about under leaves for food; or, mounting to a perch on a tree at the edge of a cleared place now grown up to thickets and saplings and surrounded by dense woodland, he pours forth his song. His persistence and monotonous ways of delivering himself have earned for him the title of "preacher" or "preacher-bird."

Saunders (1923, pp. 298-299) thus describes the song: "It is made up of short phrases of one to five notes with a short pause after each. These phrases vary greatly, and a little careful observation will show that each individual bird has twenty-five to thirty different ones, repeating certain of them frequently, but others more rarely." His song has been translated thus: "See me; up here; in the tree," repeated again and again.

During the nesting season and afterward while still feeding young, the bird often utters a complaining nasal "*whang*." In late July I frequently heard this note in the village of Cleveland.

The basket-shaped pensile nest is a firmly woven structure of plant fibers, strips of bark and fine rootlets; the interior is smoothly lined with rootlets and pine needles while the outside is decorated with light-colored pieces of birch bark, spiders' webs and cases and other whitish materials. Ordinarily it is suspended from the fork of a bush or sapling, five to ten feet from the ground. I have noted little tendency to vary in these particulars among the several nests that I have found in the region. The nests are usually placed in sapling growths and I have found more of them in the Parker and neighboring woods south of Lakeport than in any other place about the lake. These are mostly low-lying, deciduous woods, with a considerable thicket of maple, beech and elm seedlings. Nowhere in the region does the bird exhibit a liking for evergreen woodland. Three or four eggs comprise the average clutch; they are laid in late May and through June.

This is one of the species of birds most imposed upon by the cowbird. I have seen adult red-eyes feeding the young of the cowbird in the woods east of Verona Beach, as late as August 1, when the cowbird was larger than the foster parent. Ordinarily the young vireos have left the nest by late June or early July, but they are attended by the parents for some time afterward. On July 3 and 5, I found nests in the Parker and adjoining woods from which the young had departed but a short time before. Near one nest an adult appeared with a mayfly for the young. A white-breasted nuthatch persisted in tormenting

the young red-eye. On July 30, at Baker Point, west of Constantia, I found young out of the nest.

Only about one-seventh of the food of this vireo is composed of plant material, mostly blackberries, elderberries, and fruits of spice bush, dogwood, Virginia creeper and sassafras, all wild fruits and taken mostly from August to October. The remainder of the diet consists largely of caterpillars, moths, beetles, hymenopterans, bugs and flies. Most of these are injurious to forest trees and other plant growth. "The only harm done by the Red-eye is the destruction of certain useful parasitic and predatory insects, but in view of the splendid record of the bird in feeding on injurious forms, this may well be overlooked." (McAtee, 1926, p. 72.) Certainly this very common woodland bird must be a factor in keeping down the numbers of noxious insects in the region under consideration.

The large size of this vireo, the ashy crown bordered on either side by a blackish line below which is a whitish line, the white under parts, lack of wing bars, and red iris are helpful field characters.

Warbling Vireo. *Vireo gilvus gilvus* (Vieillot).

This vireo occupies second place in point of numbers of the vireos in the Oneida Lake region. It is a common summer resident all about the lake and breeds in the tall trees along the highways and about villages and farm houses all through the lake territory.

My earliest spring date for the warbling vireo is May 6, when it was recorded at the village of Central Square but, on the average, it probably arrives a little earlier than this, possibly late in April. Ordinarily it leaves for its southern winter quarters in September, but Sadler (1926, p. 17) says, "Latest date seen and heard, October 21, 1924." Eaton (1914, p. 370) says: "It is not quite so generally distributed as the red-eyed vireo, but undoubtedly breeds in every county of the State with the exception of the interior of the Catskill and Adirondack districts."

The warbling vireo is the commonest of the vireos of the open districts and along highways lined with tall trees; it seems also to like old orchards and groves more than it does wooded situations. The larger trees along the highway leading from Lower South Bay to Short Point and Hitchcock Point and, indeed, all about the south side of the lake, are favorite retreats of this bird from the time of its arrival until August. My field notes contain numerous statements similar to the following: "June 22, 1928; Cleveland. In tall trees at roadside here. June 26, 1928. Vicinity Fish Creek Landing. Fairly common in tall trees at roadside and in vicinity of houses in the village. July 6, 1928. Lower South Bay to Cicero Swamp southwest of Clay. Roadside trees in vicinity of farm houses; not in swamp." Although this bird occurs all about Oneida Lake it is less common in all the north-side districts with the possible exception of small wooded tracts in the immediate vicinity of Cleveland, Constantia, Bernhard Bay, Jewell and North Bay. The open flats, more or less cultivated and thickly populated and with scattering tree growths such as characterize the south side districts, are much more to its liking.

In spite of its real abundance here the warbling vireo is seldom seen by local residents. Its grayish, olive-green coloration, retiring habits and the fact that it keeps well to the tops of the tallest trees, all assist it in escaping common notice. However, its characteristic song,—a loud, rolling warble—frequent and sometimes long continued, gives ample evidence of its common occurrence and wide distribution in the region.

Saunders (1923, p. 263), thus describes the song of this bird: "It is a sweet warble, of usually ten to twenty notes, varying in pitch, but seldom with two notes together on the same pitch. The song is continuous and rapid, all the notes being linked together. Every fourth or fifth note is slightly accented, and the song frequently ends on a high-pitched, accented note." Other writers in attempting to describe the continuity and variation in pitch of this song say that it seems to be traveling around in the form of a figure eight. In contrast to the red-eyed vireo, after the middle of July the song of the warbling vireo diminishes a good deal in volume, frequency and regularity until in late July and early August its then faint song is confined largely to the early morning hours, and the intervals between songs are correspondingly lengthened. There is no mid-day singing such as is so commonly heard earlier in the season.

In the Lower South Bay district I observed the species mating on May 19.

The usual complement of eggs is four and they are laid in late May or early June, in a nest suspended from the forked branch of a maple, elm, cottonwood or other shade tree, at a height of fifteen to forty feet from the ground. On June 21, 1929, Mrs. Stoner found a nest with young apparently well advanced in growth, for the adults were carrying away good sized pellets of excrement and making frequent trips with food. The pensile nest was forty feet up in a hard maple tree and was attached to a limb overhanging the main highway about a mile west of Cicero Center.

Like our other representatives of the family, the warbling vireo is highly insectivorous in its food habits and takes great numbers of destructive tree-inhabiting insects such as caterpillars, leaf-chafers, wood borers, plant lice and scale insects. Chapin's studies (1925, pp. 13-15) of 340 stomachs of warbling vireos taken from twenty-nine States, the District of Columbia and Canada, show that of the food for the year, approximately 15.5% is composed of beetles, 35.4% of moths, caterpillars and allied forms, 16.7% of true bugs, 9.4% of two-winged flies, 5.9% of wasps, bees and other hymenopterans and 4.4% of miscellaneous insects. Among the insects taken is a considerable proportion of beneficial ladybird beetles and stink bugs. The vegetable food of the warbling vireo consists mostly of smaller wild fruits such as cherry, bayberry and blackberry and comprises only about six per cent of the bird's food for the year.

The grayish olive-green upper parts, white under parts slightly washed with yellowish at the sides together with the lack of wing bars will aid in distinguishing the warbling vireo.

WOOD WARBLERS: FAMILY COMPSOTHYLPIDAE

Black and White Warbler. *Mniotilta varia* (Linnaeus).

Neither during migration nor as a summer resident does this bark-creeping woodland warbler appear to be very common in the Oneida Lake region. It is typical of the Canadian faunal zone and, according to Eaton (1914, p. 379), is much commoner as a summer resident in eastern New York than in the central and western parts of the State. Judging from my two seasons of observation here I can class this bird as only moderately common as a transient and considerably less common as a summer resident.

Late in April first spring arrivals may be expected from the winter home which extends from southern Florida to South America. My own earliest date is May 3, 1929. Throughout most of May this warbler is fairly well represented in the deciduous woodlands of the region. It frequents the old willow trees in such places as Hitchcock Point and Short Point, the mixed woods just south of the West Monroe Cemetery and the Vandercamp woods near Cleveland perhaps as freely as any other situation in this territory. At this season, too, it sometimes may be seen in the trees about houses and in villages. By the end of May many of the birds have moved on northward to breed so that the numbers that remain are few. From mid-August and through September, the local population is augmented by arrivals from the North and by October 10, or possibly a little later, most of the birds have left this latitude.

My June records for the black and white warbler are all from the dense mixed hemlock woods or the vicinity of such woods on the north side of Oneida Lake. As the breeding season arrives the bird becomes less generally distributed and concentrates in the wooded sections. Excerpts from my field notes during this month will give some notion of the type of habitat chosen by it.

"June 10, 1929. One bird in a low thicket of maple saplings two miles north of Cleveland. Later, I saw another as it sang in the top of a tall dead chestnut tree. Mrs. Stoner also saw one along a road through a hemlock-beech-maple woods near Black Creek, four miles north of Cleveland.

"June 20, 1928. Heard the fine high-pitched voice of this bird, 'wee-seé, wee-seé, wee-scé, wee-seé,' several times in the Vandercamp hemlock woods; also saw two individuals climbing about in their industrious search for food. I suspect that the bird breeds here.

"June 22, 1928. Saw a black and white warbler in the aspen thickets about two miles northeast of West Monroe.

"June 28, 1928. Dense hemlock woods on the F. C. Soule estate. Heard several black and white warblers here to-day. The species seems to be of more frequent occurrence here than in any other locality I have visited, yet it is not actually common. Saw one bird and heard others at Francis Pond."

During July I have seen the bird a few times in the Panther Lake and other north-side wooded districts; and on July 28, 1929, at the Fish Creek railroad station.

The black and white warbler frequents not only the dense mixed woodlands, during the summer, but also the tangles of brush and vines and the small aspen

and other sapling growth that have sprung up in slashings and old burns. Such situations are of frequent occurrence in the Maple Flats and Constantia Center districts.

This warbler lives about the trunks and larger limbs of deciduous trees, which it scans continually for food. It creeps about much after the fashion of a nuthatch, but sometimes clings to a small twig or branch as it stretches its neck to search the under side of a leaf. Its creeping movements are rapid, punctuated with numerous stops for investigation of crevices and holes where insects may be lurking. Its course may be downward as well as upward, and in any other direction. As it moves through the woods it utters its thin wiry note at intervals. This song is subject to considerable variation and additions or subtractions are apparently made to the main theme without the loss of its identity. Various other notes also may be uttered by the bird, the ones most frequently heard being a weak "*tsip*," a louder "*chick*" and sometimes a buzzing "*chee-chee-chee*."

Nests of the black and white warbler I did not find, but mixed or deciduous woodlands are said (Forbush, 1929, p. 198) to be the type of habitat usually chosen as a nesting site. While I feel reasonably certain that the bird nests in certain parts of the Vandercamp and Widrig woods, both of which offer suitable conditions, I have not been able to verify it. Ordinarily the nest is well hidden in a depression on the ground, at the foot of a stump or near a fallen log. Grasses, rootlets, leaves and mosses enter into its construction and the lining is of plant down, hair or other soft material. The four or five whitish eggs are spotted with brownish, the spots tending to be aggregated about the larger end. "In southeastern New York the eggs are laid from the 10th to the 20th and 30th of May; in western New York the first are commonly found between the 20th of May and the 12th of June. Birds were found near Mt. Marcy feeding their young on the 1st of July, which would seem to give June 5th or 10th as the proper date for that year in the Adirondacks." (Eaton, 1914, p. 380.)

Aside from the fact that the species was present in the Oneida Lake region throughout our two seasons of observation, I have only one other bit of evidence to submit regarding the likelihood of its breeding here. On July 20, 1929, in the blueberry bushes at the edge of the Widrig woods northeast of Cleveland, I saw adults feeding a young bird not long out of the nest, but able to fly. Some of the down feathers still clung to its juvenal plumage.

Regarding the food habits of the black and white warbler, McAtee (1926, p. 76) says: "The food is chiefly insects but considerable numbers of spiders and daddy-long-legs also are eaten. Beetles, caterpillars, and ants are the larger classes of insect food, but moths, flies, bugs, and a few hymenoptera also are eaten."

Male: Upper parts streaked with black and white; two white wing bars. Throat and upper breast black or black and white, the sides streaked with black and white; middle of belly white. Bill, slender, slightly decurved. Female: Similar, but streaks not so pronounced, less black on sides of head, and entire plumage more or less washed with brownish.

Prothonotary Warbler. *Protonotaria citrea* (Boddaert).

Since the prothonotary warbler is more characteristic of the Carolinian area of the Upper Austral zone, I had scarcely expected to find it in the Oneida Lake region where such faunal elements are largely lacking. However, on June 2, and again on June 7, 1928, I found this bird in the lower swampy wooded area near the mouth of Chittenango Creek. On the former date a female was observed in the tall willows near the west bank of the creek and about 150 yards from its mouth. The warbler was studied for some time at a distance of about fifteen yards with six-power binoculars. On the latter date a male was seen on the east bank of Chittenango Creek almost opposite the place where I saw the female on June 2. This bird sang with really "startling intensity" and since it remained in the tall willow on the bank of the creek for some time I had ample opportunity to study it. These are my only records for the species in the region.

This delicately colored orange-yellow warbler is ordinarily found only in the warmer portions of Eastern United States, and in New York State the few records of its occurrence indicate that it is here hardly more than an accidental visitant. However, from the evidence available it seems that the species may gradually be extending its range northward. So far as I know there is no definite information regarding the breeding of the bird in New York.

The prothonotary warbler prefers low swampy forested areas and is usually not found far from water. The nesting place is unusual for a warbler for the bird chooses hollow trees and deserted chickadee or downy woodpecker burrows, often in a willow tree near the water.

Male: Back yellowish olive-green; rump, wings and tail grayish; tail when spread shows a large amount of black and white. Head, neck and under parts bright yellow. Female: Similar, but duller. In addition, the large size, long bill and lack of wing bars are helpful field characters.

Golden-winged Warbler. *Vermivora chrysoptera* (Linnaeus).

June 11 and 20, 1928, are the only two observation dates I have for this species and both suggest the likelihood of the bird nesting here. On the earlier date I found a male feeding in the tops of tall white oaks and ashes growing on the low flat at the west side of Chittenango Creek. Parenthetically I may say here that this is one of the most promising places in the entire region in which to look for warblers, particularly during May and early June. The birds seem to concentrate here in the tall trees and alder thickets bordering a cleared area in a low boggy meadow, before moving across the lake to the extensive woodlands. Protection from the chill northwest winds and exposure to a warm morning sun are other features that evidently make the place attractive to them. The golden-winged warbler was singing as he fed. Its song was something like that of the black-throated green warbler, but fainter and shorter, being made up of four syllables only. It sounded to me like "Zee, ZEE, zee, zee," i.e., like the last two-thirds of the black-throated blue's song.

On the 20th, the golden-winged warbler was heard twice on the F. C. Soule estate near Vandercamp Pond. Here there is a rather heavy mixed maple-birch-beech-hemlock woods.

This warbler is recorded (Eaton, 1914, p. 386) as "a fairly common summer resident locally in the highlands and in various localities in the Hudson Valley, central and western New York," but from the few individuals seen in 1928, and the apparent absence in the region during the season of 1929, I judge that, in this territory at least, it is more or less uncommon and irregular in its occurrence. It may be expected here any time after May 15; and it probably leaves for the South in late August.

Swampy thickets and bushes in low-lying fields and the margins of boggy wooded tracts are the most attractive situations for this handsome warbler.

Male: Bluish gray above with bright yellow patch on forehead and crown and another on wing. Throat black; a large black patch from bill through and below the eye extends over the ear-coverts. Under parts mainly whitish. Female: Duller than male, grayish instead of black on throat and sides of head.

Tennessee Warbler. *Vermivora peregrina* (Wilson).

This warbler is easily identified by its song. It is likely to be heard in the Oneida Lake region as early as May 10, and I have records of its occurrence at Cleveland as late as June 28. In 1929 I did not record the bird earlier than May 18, nor later than June 6. The Van Antwerp woods, Hitchcock and Shackleton Point districts, and Cleveland and Panther Lake districts are among the localities where the Tennessee warbler was observed. It seemed to be commoner in the Cleveland district than elsewhere and I often heard it in the tops of the tall cottonwoods in the village during late May and early June when it reached the peak of its abundance.

While I have several late June records for this warbler at Cleveland I am not at all sure that it nests here. Its presence, however, at that time points to the possibility that it is a summer resident.

The Tennessee warbler is generally recognized as a migrant in New York, commoner in the western part of the State than in the eastern and appearing in greater numbers in autumn than in spring. Northward migrants may be expected any time after the first week in May; ordinarily all have gone north by June 1, but my records for the Oneida Lake region extend well *through* that month. In autumn, returning birds are likely to arrive by mid-August. It is altogether probable that the species nests in the Adirondacks but I do not know if there is conclusive evidence on this point.

Silloway (1923), however, does not include this species in his list of summer birds of Cranberry Lake which is about eighty miles from Oneida Lake.

During the spring migration the Tennessee warbler usually keeps well to the tops of tall deciduous trees where sight of it is rendered difficult. But its loud, distinctive voice directs attention to it and the persistent observer is sure to be rewarded by at least a fleeting glimpse of the singer. The song has been described aptly by Farwell in Chapman's "The Warblers of North America" as follows: "Very loud beginning with a sawing, two-noted trill, rather harsh and very staccato, but hesitating in character, increasing to a rapid trill almost exactly like a Chipping Sparrow, a noticeable but not musical song."

Male: Upper parts bright olive-green; crown and nape grayish blue. Line over eye white; under parts dull white. Female: Similar, but the crown washed with olive greenish, and under parts yellowish.

Nashville Warbler. *Vermivora ruficapilla ruficapilla* (Wilson).

I have found this warbler in the region most commonly between May 10 and 25. My earliest record is May 7. Sadler (1926, p. 17) reports the earliest spring date for the Syracuse district as April 26. Although it is common and widely distributed through the month of May, I have noted it in reduced numbers in the Cleveland district as late as June 8, in aspen thickets bordering woodlands one and one-fourth miles northeast of the village of Jewell. On July 26, 1928, I saw an adult together with young of the year in low bushes at the edge of a cut-over part of the Vandercamp woods, one and one-half miles northwest of Cleveland. This seems to establish the species as a summer resident here. Eaton (1914, p. 390) says that the Nashville warbler is locally common as a summer resident in the northern part of New York State, but that in the central and western parts it is extremely rare as a summer resident. He lists a nest with eggs from Onondaga County. I have no August records for the species in the Oneida Lake area although birds returning from the northerly breeding grounds should appear about August 15. The last ones will have departed for the South early in October.

From my observations I judge that the numbers of the Nashville warbler fluctuate considerably from season to season. During the spring of 1929 it was much commoner and more generally distributed than in the preceding season. My field notes for May 18, 1929, contain the following remark with reference to its occurrence in the Cleveland district: "I am surprised to note its relative abundance, *not* generally but in *spots*." By this I mean that locally, even where similar ecological conditions exist within a limited territory, some situations may harbor the birds while others will be without them. Other places where I have frequently seen this warbler are Van Antwerp woods, Sauers' woods south of West Monroe Cemetery, North Bay and Little Bay districts, Bernhard Bay and Kibby Lake districts, Hitchcock Point and Lower South Bay districts. At many other places about the lake I have seen an occasional individual during the height of the spring migration.

The Nashville warbler here seems to prefer coppices along the edges of woodland such as young aspen and maple and elm thickets and other small growth that springs up in cut-over and burned-over areas. In such situations I have found it singing persistently in late May and the first few days in June. This warbler and the chestnut-sided are often found together. However, it does not confine its activities to thickets, for it not infrequently visits woodlands of tall elm, maple, beech and other deciduous trees, as well as mixed forest and the vegetation in door-yards. The flowering currant is in full bloom at the time this bird reaches the height of its abundance and I have seen it visiting such shrubbery during the first part of May.

While this warbler is ever on the move and difficult to follow with the eye, its loud and compelling song is likely to invite attention. Gerald Thayer in

"The Warblers of North America" is quoted as saying: "It has two main perch songs and a flight song, all subject to a good deal of variation. It belongs decidedly among the full-voiced warblers. Its common perch song consists of a string of six or eight or more lively, rapid notes, suddenly congested into a pleasant rolling twitter lower in key than the first part of the song and half as long." I can readily attest the variation in the song of the Nashville warbler for I have frequently found myself uncertain as to the identity of this songster without recourse to the field glass.

The nest of the Nashville warbler is placed upon the ground in reverted bushy fields and in thickets near woodlands. It is so well concealed that it is very difficult to find. Strips of bark, grass, pine needles and fine rootlets are the principal materials entering into its construction. The eggs vary in number from three to five. Most of the eggs are deposited between late May and mid-June.

Male: Head and back of neck gray; a more or less veiled chestnut crown-patch. Eye-ring white. Back, wings and tail olive or olive-brown. Most of under parts yellow; belly whitish. Female: Similar, but paler and the chestnut crown-patch lacking.

Northern Parula Warbler. *Compsothlypis americana pusilla* (Wilson).

My only 1928 record for this species is dated June 1, when I saw a female among small elm trees in a low, boggy area at the Ladd farm in the Muskrat Bay district. The sex of the bird together with the late date suggests the possibility that the species breeds here, but I have no further evidence on this point. On May 13, 1929, from the bridge spanning Chittenango Creek at the village of Bridgeport, I saw a male in a willow tree growing in the shallow waters of the creek; and four days later I saw a female in the maple-beech-hemlock Vander-camp woods on the north side of the lake.

The above few records indicate that the northern parula warbler is a regular though not common migrant and possibly a breeder in the Oneida Lake region. It is recorded as breeding more or less locally throughout New York State and it would not be surprising if evidence of its nesting should be found about Oneida Lake. During the nesting season it seems to be commonest on Long Island and in the Adirondacks and Catskills. However, it is best known in the State as a migrant, arriving from the latter part of April to about May 15.

Whenever I have seen the bird here it has been in low, more or less boggy, moist situations. but in my experience it seems to be solitary and does not associate much with other warblers. The song of the parula is described by Chapman (1914, p. 447) as a "quaint, drowsy, little gurgling sizzle."

The small size, bluish general coloration, yellowish back, broad white wing bars, and yellow throat and breast—darker at their junction—are good field characters. The female is similar, but paler.

Eastern Yellow Warbler. *Dendroica aestiva aestiva* (Gmelin).

The eastern yellow warbler or "summer yellow bird" is the most familiar and, at the same time, probably the commonest local representative of the family as well as one of the commonest summer birds in the Oneida Lake region. It

enjoys a wide distribution in the United States, and as a summer resident occurs in all parts of New York State "except the spruce and balsam forests of the Catskills and Adirondacks, but it penetrates those regions as far as the clearings and river valleys extend." (Eaton, 1914, p. 400.) Popular attention is directed to this warbler by reason of its golden yellow coloration, its active habits, its bright song and, above all, by its tendency to frequent the shrubbery about gardens and in the vicinity of human habitations generally. Even the lilac bushes and shade trees in populous communities are not overlooked by the yellow warbler when a nesting site is to be selected.

Early spring arrivals may be expected in the Oneida Lake region late in April, but the peak in numbers is not reached until about May 15. My earliest record for the species is May 1, 1929, when several were observed in the vicinity of the Lower South Bay and Short Point districts. In 1928, my first spring record was May 5. The autumnal movement to the winter quarters, which extend from southern Mexico to Guiana, Brazil and Peru, occurs mainly in late August and early September.

So generally prevalent and abundant is the yellow warbler in the Oneida Lake region that an enumeration of the localities in which we have observed it would include practically every field station visited save those in the deep woodlands. It will be sufficient to point out that the bird prefers open more or less cultivated country as well as swampy thickets, particularly the low willow growths bordering streams, ponds and lakes. After a field trip on May 18, 1929, in the Cleveland district, I wrote as follows concerning the local occurrence of the bird: "As soon as one leaves the more open situations and the willow- and alder-bordered streams and enters the beech-maple-hemlock woods he leaves behind, for the most part, the yellow and chestnut-sided warblers and finds the black-throated blue, the black-throated green, magnolia and Canada warblers and the redstart in numbers. However, in the region as a whole, I believe that the yellow warbler surpasses any other member of the family in point of abundance."

The sparsely settled districts along the low, flat shores about Oneida Lake usually supply a heavy growth of willows where this warbler is much at home. The Muskrat Bay, Delmarter Bay, Hitchcock Point and Short Point districts afford good examples of such situations while the banks of Chittenango, Oneida, Canaseraga and Fish creeks and of the Oneida River also offer extensive willow growths so appealing to this bird.

While the yellow warbler is not so common in extensive wooded marshes like the Big Bay Swamp and the Cicero Swamp, yet it does occur in such situations, especially in the thicketed sections of the swamps, where this warbler and the Maryland yellow-throat are the principal representatives of the family.

It is at once evident that the yellow warbler is one of the dominant species of summer birds in this territory and that, in general, it is best represented in the low, flat country lying immediately to the south and west of Oneida Lake, although the low-lying shores all about this lake and other smaller lakes and ponds in the region also are attractive to it. In addition, this warbler is markedly sociable and unsuspicious and seems to enjoy the society of man, feeding and

PLEASE NOTE

Paranthetical reference to Fig. 225, page 675, should have been inserted in first line of next to last paragraph, page 623, and the name red-eyed vireo substituted for that of redstart in the title for Fig. 225, page 633 and in List of Illustrations, page 274.



Fig. 224. Nest of eastern yellow warbler with two floors constructed by the bird in an attempt to avoid incubating a cowbird egg laid in floor of original nest. Nest in rose bush at residence in Lower South Bay district. Side cut away to show interior. June 4, 1928. *a*, floor of new nest; *b*, floor of original nest on which were deposited a cowbird's egg and two yellow warbler eggs; *c*, opening of new nest; *d*, side of original nest, cut away to expose exterior.



Fig. 225. Nest of redstart in ironwood sapling. Ladd woods, Muskrat Bay district. July 18, 1928.

nesting in the immediate vicinity of his home and exhibiting little concern at his goings and comings.

Although the yellow warbler is an inveterate and enthusiastic singer from early spring to early July, its loud, rather shrill notes share the characteristics of most other warblers in lacking melodious qualities. As with many other bird songs, this one is subject to a great deal of variation, but a common one is expressed by Saunders (1923, p. 322) as follows: "*Swee-swee-swee-swee-te-te-te-swee*." The birds often punctuate their searching activities among the tops of the trees and bushes with a burst of music and the male is particularly vociferous both preceding and during the nest building activities, which are undertaken mainly by the female.

Slight diminution in either volume or frequency of song is apparent until about July 1, when longer intervals between songs are evident, but it is not until three weeks later that any appreciable modification of the voice itself becomes manifest. At that time the tones become lower and the early season enthusiasm is spent. However, as late as August 12, I have heard the birds singing with undiminished enthusiasm and but slight change in tone.

The alarm note is a loud "*chip*," varying somewhat in its mode of utterance.

A nesting site is often selected in trees or shrubs bordering streams or lakes, along shrubby fence rows or roadsides or about orchards, gardens and even in bushes and vines growing on or immediately adjacent to occupied dwelling houses.

As already mentioned the female takes the principal part in constructing the nest, which is situated at a height varying from about two to forty feet from the ground, although three to ten feet is most common. It is built usually in a bush or sapling or small tree. The structure itself is large, compact and strongly made of grayish plant fibers, fine grasses, pieces of bark and plant down, and commonly lined with plant down and fine grasses or feathers. It is firmly woven into the crotch of the supporting branch. This elaborate and well built structure sometimes requires a week of work for its completion. Four or five grayish white eggs marked with darker spots, especially about the larger end, comprise the usual clutch. Incubation is performed by the female and continues for ten or eleven days. Usually one brood is reared in a season, but we have some evidence to indicate that two broods sometimes may be reared in the Oneida Lake region.

Apparently the bird does not ordinarily begin nesting until late in May. Specific data relating to this activity are herewith submitted in chronological order by months. This list is not complete, but contains the chief points of our notes on the breeding habits of the bird in this region.

"May 29, 1928. Near Brewerton to-day I saw a summer warbler carrying a feather.

"May 29, 1929. Sylvan Beach and Fish Creek districts. The commonest warbler observed to-day. Saw a female collecting down from the blossom of a small willow growing in a white birch and alder thicket a mile northeast of Sylvan Beach.

"June 1, 1928. At the farmhouse of Ernest Ladd in the Muskrat Bay district, found a nest of the yellow warbler three feet up in a spiraea bush growing just outside the front window. At Muskrat Bay another bird was completing a nest which was situated two feet from the ground, in a wild raspberry bush growing near the water. Also at a willow swamp in the Short Point district, I saw a female carrying nesting material.

"June 4, 1929. Bernhard Bay. Saw a yellow warbler carrying food.

"June 7, 1928. Low grassy flat near mouth of Chittenango Creek. A female incubating four eggs in a nest placed five feet from the ground in a hawthorn tree.

"June 8, 1929. In an alder thicket, ten feet from the highway near Mud Pond, about a mile north of Jewell, Mrs. Stoner found a yellow warbler's nest in the last stages of construction. The nest was lined with down from willow.

"June 9, 1928. At the A. J. Pattat residence in the Lower South Bay district. A pair of yellow warblers have a nest about four feet from the ground, in a rose bush on the lawn. Mrs. Pattat tells me that a few days ago the nest contained two warbler eggs and a cowbird egg. The warbler then built a floor over her own eggs and that of the cowbird and at the same time raised the margins of the original nest somewhat. As a matter of fact an *entire new* nest had been constructed *within* the original one (Fig. 224). To date two eggs have been deposited in the remodeled nest."

If I remember rightly there are cases on record where as many as four-, five- and even six-storied nests have been constructed by the yellow warbler in an attempt to avoid incubating the egg of a cowbird. (On July 4 I again visited the nest, but was informed that two young yellow warblers had been reared in it and had left in safety late in June.)

"June 14, 1929. In a lilac bush on the lawn of a farmhouse in the vicinity of Mud Pond, found a nest four feet from ground, containing young birds four or five days old. (The birds had left the nest on June 21 the date of my next visit.)

"June 21, 1928. Cleveland district; nest twenty feet from ground, in a maple; young had left.

"June 24, 1929. Summer warbler common in the district south of Bridgeport and Lakeport. At an abandoned farmhouse three miles southeast of Bridgeport found a family of young just out of the nest.

"June 27, 1928. Common in the village of Jewell. Saw a brood of young that were said by a local resident to have left the nest about a week ago. The birds could fly well, but were still attended by the parents. Their home had been constructed in an ivy vine growing about the front porch of an occupied dwelling in the village.

"July 3, 1928. Hitchcock Point near mouth of Chittenango Creek. Yellow warblers abundant here. In an alder thicket at the edge of a willow-clad swamp where red-winged blackbirds are nesting, I found a yellow warbler's nest containing four eggs. Possibly these are a second set for it has now been about a month since we recorded the first clutch.

"July 28, 1928. That the yellow warbler is not always so successful in disposing of the cowbird's egg as the one recorded at the Pattat residence on June 9, is indicated by our finding today in the village of Cleveland, adults feeding a young cowbird as well as their own offspring. On July 16, in the Big Bay district, Mrs. Stoner saw a female yellow warbler feeding a young cowbird out of the nest and well able to fly; and on July 21, at Lower South Bay, I saw a pair of yellow warblers attending a young cowbird out of the nest. In spite of such preventive measures as the yellow warbler takes at times to escape this imposition by the cowbird, it nevertheless does more than its fair share in helping to perpetuate the parasitic species.

"August 1, 1928. Adults feeding young of the year at Cleveland and along the shore of Oneida Lake near North Bay."

According to Forbush (1907, pp. 195-196), the yellow warbler is highly insectivorous and feeds on a variety of insects many of which are destructive to the interests of the horticulturist and the gardener. Caterpillars, including those of the brown-tail and gipsy moth, canker-worms, beetles, moths, two-winged flies, grasshoppers, plant lice and spiders make up a large part of the bird's diet.

This warbler has some ability in catching insects on the wing. On one occasion in late May I watched a bird clinging to a twig high up in a tall maple near Cleveland. As it hung there head downward and with neck outstretched it repeatedly lunged to seize five or six small insects that were performing an "aerial dance" near it.

A few useful insects such as parasitic Hymenoptera and predacious and scavenger beetles fall prey to it, but on the whole the food record of the yellow warbler is excellent. From an æsthetic viewpoint also this little warbler ranks high and it is well deserving of the popular favor and esteem which it enjoys.

Adult male: Upper parts bright greenish yellow, brighter on crown. Under parts bright yellow, streaked with chestnut or reddish brown. Tail fuscous, the inner vanes of the feathers yellow. Adult female: Similar to male, but more greenish above and paler below and slightly or not at all streaked with reddish brown.

The name "wild canary" which is sometimes given this bird is more properly applied to the goldfinch, a member of the sparrow family. The male of that species is *lemon yellow* with black crown, wings and tail.

Magnolia Warbler. *Dendroica magnolia* (Wilson).

This strikingly colored black, white and yellow woodland warbler seems to be a fairly common summer resident in the heavier hemlock forests of the Oneida Lake region. It is typically a breeder in the Canadian zone as represented in New York by the Catskills and the Adirondacks, but it is said also to breed in suitable localities in the central and western parts of the State.

Although my earliest spring record for the magnolia warbler is May 11, when I saw a single male in a bushy thicket near the mouth of Chittenango Creek, I have no doubt that it ordinarily puts in its appearance in the region at least a week earlier. Of course this warbler is more abundant during the spring movement than at any other time. My field notes of May 18, 1928, contain

the following item regarding this bird: "Mouth Chittenango Creek and woods three-fourths mile inland from west side of creek. Common. Next to yellow warbler, I believe that this was the commonest warbler I saw this forenoon." During May, this warbler is pretty generally distributed all around the lake although even at that season it exhibits a preference for the larger and denser mixed and hemlock woods such as are found in the Cleveland and Jewell districts. At Dunham Island on May 25, this species and the black-throated blue warbler and the redstart were the three representatives of the family present. Other localities in which I have found the magnolia warbler particularly common during migration are, Lower South Bay, Little Bay, Big Bay, West Monroe, Constantia Bay, Verona Beach and Cleveland districts as well as the Cicero Swamp southeast of Lower South Bay.

Quite a different situation with regard to the local distribution of this bird prevails in June, for it is then that it exhibits its preference for nesting under Canadian zone conditions. My eight records of its occurrence in the region during that month are all from localities on the north side of Oneida Lake; most of them refer to the deep hemlock woods north of Bernhard Bay, Cleveland and Jewell. In the Panther Lake district and the Louis Will Game Retreat also the bird was found in numbers during this month. Deep hemlock woods afford the favorite type of habitat, and here the present species is found with three other common warblers preferring such a cool, shady retreat, namely, the black-throated blue, the Blackburnian and the black-throated green.

The magnolia warbler keeps well to the tops of the hemlocks, where it is more easily heard than seen. During this month also I found this warbler in some numbers in a mixed hemlock, white pine and cedar tract two and one-half miles northeast of the village of Cleveland.

The magnolia warbler is not so much in evidence in this territory during most of July, but I have several records of its occurrence in woodlands in the Cleveland district where it had been seen all through June. Therefore, while I have found no nests of the bird I feel certain that it breeds here, its presence having been noted continuously from mid-May to early August. At the Widrig woods, three miles northeast of Cleveland, on July 20, I found several magnolia warblers singing among the hemlocks. At that time I made the following notation regarding the five commonest species of warblers found in the hemlock woods of the region with respect to their relative abundance.

- "1. Black-throated green warbler
2. Black-throated blue warbler
3. Magnolia warbler
4. Blackburnian warbler
5. Black and white warbler"

I have often seen the magnolia in the same hemlock with individuals of one or more of these other species.

As suggested by the varied types of localities in which this bird is found during May, it often frequents deciduous woodlands as well as the trees about houses and lawns during that season. It has a habit of fluttering a good deal while feeding among the tree tops, so that the black, yellow and white plumage,

and particularly the black tail with the conspicuous white basal area, is displayed to best advantage; at the same time this habit serves as a good field character for the observer. Later in the season the magnolia warbler remains well in the mixed woods and hemlock tracts. Usually it does not frequent the lower limbs much, but remains among the higher branches. I have often found this bird singing—and, I believe, nesting—in the hemlocks bordering small cleared areas which have grown up into a thick bushy tangle. The rich full song is quite distinctive, though it is subject to a good deal of individual variation. While I have come to know it very well I am still occasionally deceived by some inflection or cadence or additional note. The song that I usually hear may be written, "*we-eto, we-eto, we-ee-to*"; the first four notes are uttered slowly, the last three more rapidly and at a higher pitch. The birds are persistent singers from late May through June and July. Even in late July and early August I have heard them singing in the Bernhard Bay, Kibby Lake, Cleveland and other districts, with the usual energy, but with diminished frequency.

As before noted I have no direct evidence that this species nests here, but its presence in numbers in the coniferous forests of this territory all through the summer strongly suggests that it does. The nest is said to be placed usually in a low spruce or hemlock, a few feet above the ground. Dead twigs of these trees, pine needles, grass and fine rootlets make up the bulk of the nest materials. The eggs are usually four, and are commonly deposited early in June. I feel sure that careful observation and search would be rewarded by finding nests of the magnolia warbler in the heavy hemlock woods to the north of Oneida Lake. The species leaves for its winter home in Mexico and Panama early in October.

Male: Crown bluish gray; cheeks and forehead black; back black, the feathers margined with greenish. A large white patch on wings; rump yellow; tail black with a broad basal zone of white. Under parts yellow, heavily streaked on breast and sides with black. Female: Similar, but duller; back greenish.

Cape May Warbler. *Dendroica tigrina* (Gmelin).

This warbler was not seen at all during the 1929 season, but in 1928 it was recorded on three occasions: May 15, Hitchcock Point, two males; May 19, lake shore, Lower South Bay, a pair; May 21, Emmons' woods, a pair.

During migration the Cape May warbler is often found with other woodland warblers and it was noted among the twenty species listed on the morning of May 21, 1928, most of them from the Emmons' woods. In the Oneida Lake region I have always observed it in the taller trees, but in Iowa I have sometimes seen it in low bushes and shrubbery more or less in the open.

The species is a migrant in New York State "and for more than a century it has been considered a rare species, but of recent years has apparently increased perceptibly in numbers so that for the last three or four years it has been a positively common migrant in various sections of western New York." (Eaton, 1914, p. 398.) Migrating birds may be looked for almost any time during May.

Male: Crown black; ear coverts chestnut; rump yellow; sides of neck bright yellow. Under parts mostly yellow, whitish on belly, streaked on breast and sides with black. A conspicuous white wing patch. Female: Upper parts grayish olive; crown with more or less concealed black; rump yellowish. Under parts yellow streaked with black.

Black-throated Blue Warbler. *Dendroica caerulescens caerulescens* (Gmelin).

Among the warblers, this reserved woodland species is a fairly common migrant and a somewhat less common summer resident in the Oneida Lake region. Although my earliest date for it is May 7, 1929, when several males were observed in the Van Antwerp woods, I have no doubt that the first arrivals put in their appearance several days earlier, perhaps even late in April. Throughout the month of May the black-throated blue is commoner and more generally distributed locally than it is after June 1, when breeding individuals only are represented and they, too, have largely retreated to the deciduous and mixed woodlands.

This bird breeds chiefly in the Canadian and Transition zones and by late August the individuals that have bred in Ontario and Quebec join those of their kind which have nested here; the species is probably represented in the woodlands about Oneida Lake well throughout September and possibly into October. The bird winters from Florida through the West Indies to Central and South America.

Obviously this is one of the species that occurs more frequently in the heavily wooded sections on the north side of Oneida Lake than elsewhere in the region. Deciduous and mixed woodlands seem to be its favorite retreats, but during migration it sometimes occurs about houses and even in villages. However, during the summer its distribution is largely restricted to such situations as the Vandercamp, Widrig, Kibby Lake, Panther Lake and similar woodlands where it frequents, for the most part, the low bushes and smaller trees forming the forest undergrowth.

A few field notes will set forth some of the features of local distribution and occurrence of this warbler.

"May 12, 1929. Lower South Bay district. That this bird is not averse to visiting the vicinity of dwelling houses was indicated by the two males observed this evening in the bushy tangle at the rear of the Eastwood residence, 150 yards from the lake shore. As late as 7:25 P. M., when it was nearly dark, the birds were in full song. Although the song is subject to a good many variations, it is uttered in a slow, deliberate fashion and is somewhat husky in quality; the one most frequently heard may be written 'zwee-zwee-zwee-zwee-e-e.' It is usually given from a perch near the ground or only moderately high up in trees. The bird is not an inhabitant of the topmost branches.

"May 14, 1928. Louis Will Game Retreat. Several birds singing.

"May 16, 1929. Commoner on the north side of Oneida Lake.

"May 18, 1928. Hitchcock Point and vicinity of mouth of Chittenango Creek. Several males and females.

"May 23, 1929. Vandercamp woods. Fairly common in the woods here; one of the commonest warblers this morning. In full song now. The low-lying second growth maple and mixed woodland that borders several small meandering streams running through this part of the Soule estate, seems to be especially attractive.

"May 25, 1928. Dunham Island. This warbler, and the magnolia and the redstart were the three species of the family found here to-day.

"June 3, 1929. Bernhard Bay and Kibby Lake districts. Seems to be almost as common as the black-throated green which is less common this season than last. Apparently the local abundance of both these species varies considerably from season to season.

"June 13, 1928. Several birds observed to-day in the dense hemlock woods two miles northeast of Cleveland.

"June 25, 1929. Heard the black-throated blue warbler to-day in the hemlock woods two miles south of the village of Oneida Lake. The bird must be breeding here.

"July 20, 1929. This is a common bird in the Widrig woods where I am sure it nests. The adults were much excited at my presence in several places to-day, but I found no nests or young. Of the local breeding warblers that nest in trees or bushes in the denser mixed and hemlock woods, I should place the black-throated blue third. My ranking so far as *abundance* of the four commonest species this season is concerned would be as follows:

- "1. Black-throated green warbler.
2. Black-throated blue warbler.
3. Magnolia warbler.
4. Blackburnian warbler.

"This warbler seems particularly to favor cleared areas that have grown up into bushy tangles and are surrounded by dense hemlock or mixed woods. It is more partial to deep woods than is the black-throated green.

"July 24, 1929. In a dense mixed white pine-maple-birch woods one and a half miles south of Thompson Corners this bird was fairly common. The males are more calm and sedate in their bearing than most warblers, and the females are very shy and much less frequently to be seen.

"July 27, 1929. Francis Pond district. In the dense second growth hardwoods growing on the hilly ground just west of Francis Pond I found this bird to-day in greater numbers than I have seen it elsewhere in the region thus far this season. Males, females and young were much in evidence among the trees, and the males were still singing. It is evident that this warbler is attracted by this type of woodland too, for on the Soule estate a similar rolling hardwood tract in the vicinity of a small creek that meanders through this district proved to be its favorite haunts.

"July 29, 1929. North Bay to Camden. Fairly common in mixed woods, but not so common as the black-throated green, and keeps closer to the ground than that species.

"August 2, 1928. Hemlock-maple woods five miles northeast of Cleveland. Present here in some numbers and still singing a little. This bird is a persistent

songster and continues its vocal efforts well through the summer, but with some diminution in frequency and energy after mid-July. In late July, too, its voice which at best is coarse and more or less husky, becomes harsher and more grating than ever and loses much of the richness and fullness that it possessed earlier in the season."

From the above items it is apparent that the black-throated blue warbler is of frequent occurrence in the more heavily wooded sections of the region where it favors particularly the Cleveland, Constantia, Jewell and North Bay districts, and on the south side of Oneida Lake the similar habitats that lie some distance from its shores.

Although I found no nests of this warbler in the region I feel sure that I was close to success on several occasions, of which the behavior of the birds gave every indication. I did, however, see young birds not long out of the nest, and adults carrying food for young.

The nesting site is in or near deep moist woods or in the margins of woodland clearings. The nest is said to be placed in small bushes or in small coniferous or deciduous trees, and from a few inches to ten feet above the ground. Twigs, vines, strips of bark, rootlets, grasses and spider webs usually make up the principal nest materials which are fashioned into a rather bulky affair. The eggs number four or five and are grayish white in color, with more or less distinct brownish markings usually aggregated about the larger end. My further notes relating to the breeding of the black-throated blue warbler in the region are as follows:

"June 6, 1929. Panther Lake district. Fairly common. Saw one female carrying nest material of dried grass. Also saw a female, possibly the same one, while in flight seize and break off a delicate twig from the limb of a tree, then light on a limb and drop the twig. Evidently nest construction is now under way. The wooded section bordering Panther Lake is the type of habitat frequently chosen by this bird.

"July 19, 1929. Woods three miles north of Bernhard Bay. In the lower mixed woodland where considerable hemlock occurs I found a pair of black-throated blue warblers attending young, and much excited at my presence. The female exhibited the well-known broken-wing ruse, the while uttering a low excited '*chip*,' and the male sang in a tree nearby as if to divert my attention to himself. The young were hidden among ferns and little hemlocks that formed a dense growth in this open place in the woods, and I could hear them uttering the food call from time to time as they moved about in the thickets.

"July 26, 1929. Widrig woods. In several places here to-day I saw adults feeding young out of the nest. Saw other adults carrying food and heard young giving the food call, in the low bushes. At another place I saw immature birds with the primaries edged with greenish-yellow, and the white patch on the wing plainly visible.

"July 30, 1928. Panther Lake district. Several males singing. Saw a female feeding young out of the nest."

The Widrig, Vandercamp and Panther Lake woods, among others in the north-side territory, are favorite nesting places as is indicated by the occurrence

of the birds here throughout the summer, and by the presence of young in late June and July.

The black-throated blue warbler is highly insectivorous. I have often watched the birds make a dash at a passing insect much after the fashion of a small flycatcher. The toll that they take of woodland insects must be considerable and it is evident that they play some part in checking the undue increase of this group. Regarding the food habits of the species, Forbush (1929, p. 236) says: "The Black-throated Blue Warbler, like others of its family, feeds largely on moths, caterpillars, including the hairy tent caterpillar, flies, beetles and plant-lice. . . ."

The male is strikingly though not brilliantly colored. Upper parts grayish blue, a conspicuous white spot on the wing. Throat and sides black; breast and belly white. Adult female with upper parts dusky olive greenish; a small dusky white spot in the wing; a whitish or yellowish line over the eye. Under parts pale buffy-yellowish.

Myrtle Warbler. *Dendroica coronata* (Linnaeus).

We have seen this common warbler at numerous places in the Oneida Lake region, between May 1 and May 23, but it seems to reach the peak of its abundance from about May 6 to 20. I have one later record when a single bird was seen in the hemlock woods half a mile north of Jewell on June 14. Sadler (1914, p. 17) states that this warbler nests at Panther Lake.

The myrtle warbler does not seem to associate much with other species of warblers, and I believe that this may be due to its own more or less gregarious habits. Distinct flocks of these birds are sometimes seen, as for example the ones we saw at the Van Antwerp woods on May 7, at Hitchcock Point on May 15 and in the Shaw Point district on May 22. Apparently the migrating flocks do not disband until they are nearer the breeding ground. My notes of May 11, 1929, contain the following remarks about this species: "The commonest warbler in the district (mouth of Chittenango Creek and vicinity) this forenoon; both males and females; migrating flocks not yet disbanded; small groups of six to eight birds seen frequently."

This is one of the earliest migrant warblers of the region and may be looked for any time after April 15; it reaches the peak of abundance about mid-May and passes on north toward the close of that month. During this migration the males precede the females and in late April and early May usually far outnumber the females. My field notes of May 2, 1929, contain the following item: "Cicero Swamp southwest of Clay; several males and one or two females." However, as the season advances and the breeding ground is approached, the females seem to "catch up with" the males, so that in this territory mixed flocks are the rule after May 10 or thereabouts.

While in New York State, the ordinary breeding range of the myrtle warbler "is apparently confined to the spruce belt of the Catskills and Adirondacks" (Eaton, 1914, p. 406). It is not unlikely, however, that it may breed casually in other parts of the State, and it may not be improbable that a few stragglers nest in the Oneida Lake region.

These warblers are active, hardy birds, sometimes found in winter as far north as eastern Massachusetts and Maine where they feed upon the berries of myrtle or bayberry. Their fondness for this food accounts for the common name of the bird. The winter range extends as far south as Panama. This warbler along with the palm warbler visits the Florida celery fields in great flocks and is an extremely valuable ally of the celery grower on account of its highly insectivorous food habits. It is particularly abundant there during January, February and March.

In the Oneida Lake region the myrtle warbler is most likely to be seen in deciduous or mixed woodland where it often feeds in the tops of maples, white oaks and elms. In the Shackelton Point district I found it fairly common in a maple-elm-cedar bog on May 8.

The yellow patch on the center of the crown, on the sides of the breast and on the rump are distinctive in this species, and it is sometimes called the yellow-rumped warbler.

Black-throated Green Warbler. *Dendroica virens virens* (Gmelin).

Mixed and evergreen forests such as are found on the north side of Oneida Lake and in the territory four to five miles south of it, as represented in the small isolated woodlots all about it, constitute the favorite type of breeding habitat of this warbler. Without doubt it is the commonest warbler of the forested districts, particularly the hemlock forests, in the region.

My earliest spring record for the black-throated green warbler is May 6, 1929, but I suspect it commonly arrives here some days earlier, possibly late in April, for when I first noted the bird it was already very common in Sauers' and the Van Antwerp woods. Here both males and females were represented, and the rapidly uttered musical "zee zee zee zu zi," was a part of the woodland melody. Throughout May, the bird is very common in the forests of this region, but as the month wanes its numbers become somewhat diminished by reason of the continued northward movement. The autumnal movement to its winter quarters in Mexico and Central America occurs mainly in late September and early October.

In the Oneida Lake region the black-throated green warbler is more generally distributed in May than later in the season when it retires to the deeper hemlock woods. During the spring movement the bird is often seen in the hardwoods along the lake shore and roadsides at such places as Hitchcock Point and the Maple Bay district, where on the other hand the bird seldom occurs during the breeding season. However, even during the spring migration this warbler is partial to extensive mixed and hemlock woods such as occur in the Cleveland, Constantia and Bernhard Bay districts, and to such smaller isolated tracts as the Emmons and Van Antwerp woods and by the tracts in the hilly section well to the south of Oneida Lake. Of localities close to the lake the Cleveland district, has without doubt, the largest population of this species.

Regarding the occurrence of this warbler in May, a field note of May 20, 1929, is of interest in that it parallels to some extent an observation of May 24, 1928, with reference to the chestnut-sided warbler. "Today, in the hemlock-maple

woods northeast of Cleveland, I observed the same phenomenon as I noted on several occasions last year. As I walked through the dense hemlock, white pine and maple woods here—it appeared to be a likely place—I saw a warbler only at usual intervals. Then suddenly I would come upon a *considerable number* of these birds, perhaps fifteen or twenty individuals, concentrated in one or two large hemlock trees exposed to more than the usual amount of sunshine. Bay-breasted, chestnut-sided, magnolia, black-throated blue, Blackburnian, black-throated green—perhaps also a Canada or a Nashville, although the latter generally seems to prefer more open country—were all gathered into a more or less compact group, singing, and feeding on hemlock buds or insects attracted to them. In a little while these birds seemed to vanish into the forest. Perhaps I would come across the same or a similar aggregation a few dozen or a few hundred yards farther on, the intervening area having been largely devoid of warblers.”

During the two seasons of our field work, we found the black-throated green warbler much commoner in 1928 than in 1929. A certain amount of seasonal fluctuation is to be expected, but I had hardly looked for so great a discrepancy in numbers in two successive summers.

A movement from the more scattered and open woodlands to the heavily forested sections north of Oneida Lake is apparent in this species from late May until about mid-June when the breeding haunts have been well occupied by it. At this time, so far as the tree-inhabiting members of the family are concerned, it is exceeded in numbers only by the redstart. Coniferous woods mixed with beech and maple now become its favorite habitat.

While the Panther Lake, Kibby Lake, Vandercamp, Gordon Pond and similar districts have been invaded by this woodland worker on the north side of the lake, the hemlock woods scattered about the flats south of the villages of Oneida Lake, Lakeport and Bridgeport, although not so extensive as the north-side tracts, do support a fair number of these warblers throughout the summer.

During most of June and the first half of July, breeding activities occupy most of the time of the black-throated green warbler. The female is not so much in evidence, but the males indulge freely in singing, often occupying a high limb or the topmost point of a hemlock tree for this performance.

As stated in a preceding paragraph, the notes comprising the song of this species are uttered rapidly, and as I remarked in my field notes under date of June 15, 1928, “The bird seems to have *two* distinct songs.” At that time I indicated the elements of the song graphically by a series of dashes, the length of these expressing the relative length of time given to each musical note while the curved line illustrates the lower tone of the penultimate note, thus — — — — —
 ∪ — or — — — — — — — — — ∪ — and — — — — — — — — — ∪ —. Some deviation from these two typical songs is common. Another field note dated June 18, 1928, relates to this characteristic of the bird. “Cleveland, Gordon Pond, Jewell and Vienna districts. This is the commonest arboreal woodland warbler except possibly the redstart. This morning I heard a bird giving a little different version of the typical song. Starting slowly it increased rapidly in cadence, the while ascending in the scale and suggesting the first part of the field sparrow’s song. The species seems to offer about as much variety in its

song as the song sparrow; the song of the bird I heard to-day might be represented like this: — — — — — ∪ —."

As the summer wanes this warbler sings with diminished vigor and frequency. Toward the latter part of July it becomes even more retiring and seeks the deeper and denser parts of the hemlock-beech-maple woods, where it sings very little during the period of molt. The absence of the bird's cheerful lay in these solitudes is particularly marked. However, even in August its note is occasionally heard, but at this season it is subject to even greater variation than earlier, and is uttered in a half-hearted, much less vehement manner. Some variation is also apparent in the call notes of this bird, but a loud "*chip*," sometimes rapidly repeated, is a common one.

On July 20, 1929, in an effort to set forth the relative abundance of the black-throated green warbler as compared with the other breeding warblers which nest in trees in dense mixed or hemlock woods, I represented the status of the four commonest species in the following order:

1. Black-throated green warbler
2. Black-throated blue warbler
3. Magnolia warbler
4. Blackburnian warbler

After due consideration of my records and field observations I can see no reason for modifying that statement.

The nest of the black-throated green warbler is usually placed in a hemlock tree from fifteen to seventy feet above the ground. Twigs and needles of conifers together with grasses, strips of bark, spiders' webs and hair make up the principal materials which are fashioned into a deeply cupped structure well out on a horizontal limb. Four eggs constitute the usual set; they are whitish with brown and purplish marks more or less aggregated about the larger end. The period of incubation is said by Burns (1915, p. 286) to be twelve days; brooding is done chiefly or wholly by the female. My notes on the breeding activities of this bird are as follows:

"May 18, 1929. Cleveland district. Saw a female carrying nest material.

"June 20, 1928. Vandercamp woods. Common everywhere in this district; its voice can be heard all day long. About 5:20 P. M. we heard young birds giving the hunger call from the branches of a hemlock tree near the south trout pond. On search I found four young black-throated green warblers together with a fledgling cowbird in a nest about forty feet above the ground. This nest was well toward the top of the tree and was constructed mainly of white pine needles. Its occupants were well protected from the elements by an overhanging branch. I furnished all of these young with U. S. Biological Survey bands. Even this woodland bird is not free from the skulking cowbird. Allowing twelve days for incubation of the eggs and eight days since the hatching of the young, egg deposition for this brood occurred about May 30.

"July 26, 1929. Widrig woods northeast of Cleveland. A good many young out of the nest here; heard food calls several times. Saw a male carrying food for young, and several young that had been out of the nest for perhaps one week."

This warbler, so typical of the dense coniferous forests, undoubtedly is of considerable value from an economic viewpoint for its food "consists in part of leaf-rollers, and many species of leaf-eating caterpillars and beetles, also bugs, flies and gnats, plant-lice and mites. It goes to orchards near its favorite woods for canker-worms." (Forbush, 1929, p. 267.)

In the breeding plumage the adult male has the upper parts yellowish olive-green; the face and sides of the head bright yellow and the throat and breast black; two white wing bars. Female: Similar, but duller above and the black of the throat more or less mixed with yellowish or whitish.

Cerulean Warbler. *Dendroica cerulea* (Wilson).

From a single record I have of its occurrence I judge the cerulean warbler to be rather uncommon in the Oneida Lake region.

On May 21, 1928, I recorded sixty-nine different species of birds during the day's field trip. Most of the time was spent in the Nicholson Point, Big Bay and Emmons' woods districts. Evidently a "wave" of migrating warblers was passing through, for of the total number of species listed, twenty were warblers, the present species among them. I saw three ceruleans on this occasion, in the high maples at the Emmons woods.

While the known breeding range of the cerulean warbler includes central and western New York, the species seems to be local in its distribution. Sadler (1926, p. 17) records a nest at Cross Lake, May 21, 1922. I kept a sharp lookout for the species in the Oneida Lake territory, but I did not see it again.

This is a bird most abundant during the breeding season in the Mississippi Valley and contiguous territory. If it should occur regularly in the Oneida Lake region it is to be looked for some time during the first three weeks of May. It usually keeps to the tops of tall hardwood trees and flits about so actively that it is difficult to follow. The loud trill "zwee-zwee-zwee-wee-ee" will aid in its identification.

The preferred nesting habitat of the cerulean warbler is in deciduous or mixed woods in the vicinity of water—more or less swampy conditions appeal to it. The nest is usually placed well out on the limb of a deciduous or coniferous tree, from fifteen to sixty or more feet above the ground. Weed stems, strips of bark, grasses, rootlets and mosses comprise the bulk of the nesting materials. Ordinarily lichens are worked into the exterior of the nest in a kind of decorative fashion. The usual complement of eggs is three or four. They are pale bluish white or greenish white speckled with reddish brown and lilac. One may expect to find eggs from late May to mid-June.

Male: Upper parts bright cerulean blue, the back lightly streaked with blackish; two white wing bars. Under parts pure white with a bluish band across the breast; sides streaked with bluish black. Female: Upper parts bluish olive-green. Under parts pale yellowish, faintly streaked on the sides.

Blackburnian Warbler. *Dendroica fusca* (Müller).

This, the handsomest and at the same time one of the most strikingly colored of our wood warblers, is a common migrant in the Oneida Lake region and in the mixed hemlock woods on the north side of the lake and is a rather common

summer resident. My earliest spring date for the Blackburnian warbler is May 14, but Sadler (1926, p. 17) gives "May 2, 1913 and 1916," as the earliest date seen in the Syracuse district, so that the bird may be expected here in early May or even during the last few days of April.

During migration I have often seen it in tall maples and other deciduous trees at Hitchcock Point and in the Lower South Bay district, frequently in company with the chestnut-sided warbler. In the hemlock woods such as occur in the Cleveland district it not infrequently associates loosely with the black-throated green and the magnolia warblers at this season. I believe that during migration the Blackburnian warbler is partial to the hardwoods such as those in the Lower South Bay, mouth of Chittenango Creek and Little and Big Bay creek districts, but that as the season advances it withdraws into the low-lying mixed or deep hemlock woods such as the Vandercamp, Louis Will Game Retreat and Widrig tracts which it frequents all through the summer. Not only during migration but also throughout the breeding season the bird usually keeps well to the tops of the trees.

At the time of the spring movement "waves" of these birds are sometimes noted. This concentration of migrating birds was noticeable but not particularly well-marked in the Oneida Lake region during the spring of 1929, in spite of the fact that warblers in general were not as abundant either in individuals or species as in the previous season. The season of 1929 was very backward and warm weather was a minus quantity until late May. The local status of this warbler seems to reflect these conditions to a more noticeable degree than is apparent with a good many other species. My field notes of May 23, 1929, contain the following memorandum concerning the Blackburnian warbler: "Vandercamp woods; saw and heard more than a dozen birds, both males and females, here this morning. Commoner than I have observed it before; commoner than the magnolia. Tall hemlocks in maple and beech forest. Constantly uttering in a fine, wiry, high-pitched, more or less metallic voice its characteristic 'zee-zee-zee-ee-e' ascending in pitch toward the end; sometimes the song seems to run 'clink-clink-zee-clink,' or 'clink-clink-zee-clink-clink.'" The migratory movement is over by the end of May, the maximum abundance being reached about May 23. After mid-August the return movement to the South begins, but I have observed no perceptible activity here up to August 15. The last birds have left for their winter quarters in Central and South America by mid-October.

As above mentioned, the Blackburnian warbler is found not infrequently during the summer in the mixed hemlock and pure hemlock woodlands north of Cleveland, Constantia and Jewell. It is more easily heard than seen, but fortunately for the observer, the bird has the habit of fluttering as it feeds among the trees so that its conspicuous orange-yellow, white and black plumage is well displayed. Earlier in the season the birds are sometimes found feeding on the ground in tall hardwoods. That it is not confined during late spring to the hemlock woods alone is indicated by our observations of June 10, 1929, when it was discovered in some numbers in a cut-over tract containing aspens, wild cherry and white pine two miles north of Cleveland. However, in the hemlock-beech-maple woods a mile away it was markedly commoner.

This bird sings during migration as well as during the breeding season. Often in the midst of its energetic feeding activities it will pause to utter its high-pitched song, which is subject to considerable variation, so that its interpretation has been almost as varied as have its interpreters. The one given in a preceding paragraph will perhaps do as well as any. After it is once recognized the high-pitched note is quite distinctive. I have heard this song here as late as July 20, in the denser hemlock portion of the Widrig woods. However, at this season the volume of the song as well as its frequency has diminished perceptibly.

"The nesting site of the Blackburnian is usually the horizontal limb of a conifer, spruce or hemlock. The nests reported by Mr. Burtch from the gullies near Branchport were in hemlocks, about thirty-five feet from the ground and six feet from the tree trunk. The nesting date in New York varies from May 24 to June 12." (Eaton, 1914, pp. 422-423.) Eaton (*loc. cit.*, p. 421) also records the nesting of this species from Remsen and Holland Patent, Oneida County, on authority of Ralph and Bagg; and from Stockbridge, Madison County, on authority of Maxon; also from several other points more distant from Oneida Lake. The usual complement of eggs is four.

Although I found no nests in the Oneida Lake region, in addition to the presence of both males and females in the hemlock woods throughout the breeding season, I noted on June 20, 1928, in the Vandercamp woods, a male and a female carrying food; and on July 20, 1929, in the Widrig woods I saw an immature bird in the dense hemlock portion of the woods.

On several occasions I have observed adult birds flitting about in the tree tops and at the same time heard the food call of young birds, presumably of this species.

The rich orange on throat and breast, through center of crown and behind the black ear coverts, and the large patches of white in the tail are helpful field characters in distinguishing the male. The female is similarly colored, but the markings are paler.

Chestnut-sided Warbler. *Dendroica pensylvanica* (Linnaeus).

Not only is this sprightly warbler pleasing to the eye but its full voiced song constitutes one of the most melodious bird voices among our summer residents. The chestnut-sided warbler is an abundant transient and a common summer resident in the Oneida Lake region, where it arrives early in May. My earliest records are May 14, 1928, and May 15, 1929, but I think that the first migrants reach this section some days earlier. Toward the close of May its numbers diminish somewhat, as the individuals which nest farther north move on, leaving only the local breeding birds in the bushy fields and pastures and thicketed margins of woodlands. About mid-August the local numbers are somewhat augmented by northern arrivals, but practically all the birds move south by October 1. The principal winter home of this warbler is in Central America.

This is one of the birds which have been benefited by the deforestation that has almost everywhere followed upon the settlement of new country by man. As great areas of the cut-over districts have been largely abandoned after removal of the timber, bushes and tangles and small second growths have sprung up.

Such conditions are found in many places in the territory under consideration, but more particularly in the high rolling and hilly country in the Constantia, Bernhard Bay, Cleveland, Jewell and North Bay districts; and here, as in similar districts elsewhere, the chestnut-sided warbler breeds and thrives. In contrast to the yellow warbler, the chestnut-sided does not frequent the vicinity of human habitations, but if abandoned garden and berry patches, vineyards and fields are available they form a veritable haven for it. Such habitats are frequent in the territory on the north side of Oneida Lake, and here the chestnut-sided warbler is much commoner than in the lower, flatter, more open, thickly populated and intensively cultivated areas immediately south and east of it.

From my field notes I quote the following details regarding the occurrence and abundance of the chestnut-sided warbler in the territory.

"May 14, 1928. Sauers' woods half a mile south of West Monroe Cemetery. The chestnut-sided was abundant here this morning. A migratory 'wave' of the species seemed to have reached this place and the thicketed margins of the woods were full of them.

"May 17, 1929. Cleveland and Bernhard Bay wooded districts. One of the commonest if not *the* commonest of the woodland warblers here at the moment.

"May 18, 1929. Vicinity of Cleveland and Delahunt woods. Of the twelve species of warblers seen and heard today, the yellow warbler was most abundant and the chestnut-sided next.

"May 20, 1929. Hemlock and mixed woods northeast of Cleveland.

One of the commonest if not *the* commonest warbler here this morning.

"May 21, 1928. Little Bay and Big Bay districts. The most abundant warbler seen today.

"May 22, 1928. West Monroe district. Common here in thickets at margin of woods.

"May 23, 1929. Vandercamp woods. The commonest warbler here today.

"May 24, 1928. Today I was much impressed by an occurrence that I have noticed on several previous occasions, but concerning which I have made no note. While in the mixed woods—maple-birch-hemlock—north of Cleveland, I suddenly found myself in the midst of a considerable assemblage of warblers, in the lower branches of the trees and higher up as well. Blackburnian, black-throated green, black-throated blue and chestnut-sided, particularly the last named, predominated in numbers. The birds in this loose mixed flock fed and sang quite unconcernedly for a few minutes, the chorus of mixed voices being especially striking. Suddenly, the melody ceased as if by magic and the birds disappeared into the depths of the forest. As I walked on through the woods I came to another (or the same) group which, after a little, also disappeared in the same manner as before, and the woods became silent except for the notes of the oven-bird and the red-eyed vireo. Apparently at this season several species of warblers often travel and feed together in more or less gregarious fashion, the chestnut-sided lending its presence freely to these loose groups. No doubt therefore that what I saw was an illustration of the massed movements that frequently occur among migrating birds.

"May 29, 1929. In a white birch and alder thicket a mile northeast of the village of Sylvan Beach this was one of the commonest warblers this morning.

"June 3, 1929. The bird is now less generally distributed and is haunting the typical breeding habitats. North of Cleveland in open bushy places such as blackberry thickets about abandoned farmhouses and among the second growth saplings and brush piles the bird is especially common.

"June 8, 1928. Fairly common and, I think, nesting in a great patch of blackberry tangles, along with the yellow warbler, near the highway one mile north of Emmons' woods.

"June 11, 1929. Less common in the thickets about Verona Beach than in those on higher ground in the cleared areas and about the woodlands north of Cleveland.

"June 18, 1928. Cleveland, Gordon Pond, Jewell, and Vienna districts. A very common warbler everywhere at the edge of woodland.

"July 9, 1928. Clay and Oak Orchard districts. Common in high-bush blackberry thickets at the edge of woods south of Clay. Also saw an immature bird in the woods north of Schroepfel's Bridge.

"July 18, 1929. Very common in the aspen, maple and blueberry thickets in the extensive cut-over areas in the Delahunt woods and in similar situations in the Widrig woods. Even bushy clearings in the midst of deep hemlock woods have been invaded by these birds."

This bird was also observed on Frenchman Island on May 25, 1928.

The summer haunts of the chestnut-sided are near or with those of the yellow warbler, indigo bunting, field sparrow and towhee. It is distinctly lacking from the dense beech and maple woodlands.

This warbler is a pleasing songster. Its song, a loud clear warble, is somewhat variable especially as the breeding season wanes, but there is at the same time a good deal of individual difference in singers. In the common song of the chestnut-sided the next to the last note is accented and of a higher pitch than the rest. Eaton (1914, p. 414) writes it "*wee-chew, tit-a-wit-a-wit-a-wit-we chew.*" Another common song is more or less of an elaboration or variation of this one.

A marked cessation of song appears in this bird. While we heard it singing as late as July 17, it was seldom heard after that time. On August 6, males still in full breeding plumage were seen but they were not singing. At this season, too, this warbler is much less in evidence than in May and June.

The edges of bushy fields, low second growth hardwoods, old bush-covered burns, blackberry and similar thickets are the type of nesting habitats chosen by the chestnut-sided warbler. The nest is placed not far from the ground and is constructed of coarse grass, strings of bark, plant fibers and similar materials; a lining of rootlets or fine grasses is provided. Four whitish eggs, irregularly marked with brownish, principally about the larger end, comprise the usual clutch.

Among my field notes relating to the breeding habits of this bird in the Oneida Lake region, the following are of most interest.

"May 22, 1928. In the bushy tangles of the old clearing at the edge of the Sauers' woods south of the West Monroe Cemetery, a pair has just started to build a nest in a small pin cherry tree, about two feet from the ground. The nest materials are principally of plant fibers, bark, grass and rootlets.

"May 31, 1929. A very common bird among the wild blackberry and other bushes in open areas in the woods about Gordon Pond. Saw a female carrying nest material.

"June 6, 1929. A female carrying nest material in the Panther Lake district.

"June 25, 1928. In the bushy margins of the Vandercamp woods this is a common species. Adults carrying food for young, but I could not find the nest.

"June 27, 1928. Woods about three miles northeast of Cleveland. An adult bird carrying food.

"July 23, 1929. In a bushy, cut-over tract of second growth on the south side of the Vandercamp woods, I saw an adult male carrying food (mayflies) for young.

"July 26, 1928. Saw an immature bird able to fly, at the edge of the Vandercamp woods one and a half miles northwest of Cleveland.

"July 27, 1929. Young of the year in aspen and blueberry thicket growing on a cut-over area two miles northwest of Bernhard Bay.

"July 27, 1928. Young of the year near Jewell.

"August 2, 1928. Young of the year in Delahunt woods northeast of Cleveland."

While it is possible that an occasional second brood may be reared in a season, the nest building activities of late May and the ten- or eleven-day incubation period easily permitting, I believe that one brood in a season is the rule.

Concerning the food of the chestnut-sided warbler, Forbush (1913, p. 194) says that it "is such that the bird must be exceedingly useful in woodland and shrubbery, and in orchards and shade trees as well, whenever it frequents them. It is probable that at times it destroys numbers of parasitic hymenoptera, as it is rather expert as a flycatcher; but it is very destructive to many injurious beetles and caterpillars, being one of the most active consumers of leaf-eating insects. Small borers or bark beetles, plant bugs and plant lice, leaf hoppers, ants, and aphids are eaten."

A highly insectivorous bird that is as common as the chestnut-sided warbler in the Oneida Lake region from early May to late September,—almost five months—can not help exerting a beneficial influence.

Adult male with plain yellow crown and under parts pure white except a broad chestnut stripe on each side; a white wing patch composed of the usually coalesced wing bars. A black patch in front of the eye narrows posteriorly to form a line above the eye; another black line extends down the side of throat. Adult female similar, but colors less distinct, the spot before the eye usually lacking and the chestnut streaks less pronounced.

Bay-breasted Warbler. *Dendroica castanea* (Wilson).

This fine species was seen on several occasions during both seasons at Oneida Lake, and I should call it a fairly common and regular though rather late migrant in this region. Between May 15 and May 25, I have seen it in the Lower South Bay district, along the lake shore near the club house of the Syracuse Yacht and Country Club, in tall maples at Hitchcock Point, Emmons' woods and in hemlock woods three miles northeast of Cleveland.

The bay-breasted warbler seems to travel with other species of warblers during its movements through this region, for I have commonly observed it with the black-throated green, Blackburnian, magnolia and black-poll warblers. On May 20, I found several bay-breasted warblers in the tall hemlocks in the woods three miles northeast of Cleveland, and accompanied by the first three species mentioned. This also was one of the twenty different species of warblers seen on May 21, 1928, most of them, the present species included, being found in the Emmons woods.

On May 25, 1929, a "wave" of bay-breasted warblers—all males—seemed to have arrived at the Emmons woods. Here among the beech, maple, birch, ironwood, ash and elm saplings which form a fairly dense but low thicket on a marshy hillside, about twenty of these birds were seen in the course of two hours. The bay-breasted warblers were feeding and preening themselves quite unconcernedly a few feet from me. Black-poll warblers also were very common here on this occasion.

In most parts of the State the bay-breasted warbler is a common though somewhat irregularly distributed migrant, arriving in the spring about mid-May and returning in autumn during the latter half of September. In the East it breeds from northern New Hampshire and Maine on northward. Its winter home is in Panama and Colombia.

With us it is, for the most part, a bird of the higher tree tops, but on occasions it may congregate in numbers in the lower branches and tops of small hardwood saplings. Mixed forests also are sometimes chosen by it, as well as orchards and shade trees. Eaton (1914, p. 417) quotes Farwell's description of the song of the bay-breasted warbler as a "weak, monotonous, saw-filing note," and with this I agree.

In spring the chestnut crown, throat, upper breast and sides and whitish under parts afford ready field characters in the case of the male. There are two white wing bars. The female has the crown olive-green, streaked with black and sometimes with chestnut, the back brownish gray streaked with black as in the male, and the under parts buffy white with more or less chestnut at the sides.

Black-poll Warbler. *Dendroica striata* (Forster).

This active and abundant though late migrant among the warblers was noted in most wooded situations of any extent in the Oneida Lake region, between May 15 and June 8. It seems to reach the peak of abundance during the last week in May, its numbers previous to that time having been built up gradually by additions from the South. After June 1 the local abundance of the species diminishes rapidly by reason of the general northward movement. Distinct "waves" of migratory movement seem to be more pronounced in the black-poll warbler than in any other species that occurs in the region. These waves are most marked during the last three or four days of May and after the bulk of the warblers have passed through. An excerpt from my field notes will illustrate this and other characteristics of the warbler:

"May 28, 1928. Hitchcock Point and mouth of Chittenango Creek district. The black-poll warbler very common here this a.m.; only the yellow warbler

exceeds it in numbers. Its song of six or eight thin, clear, high notes uttered rapidly and swelling in the second one-third, then falling off slowly, is heard on all sides. More individuals of this species here than I have ever seen before. The general warbler movement seems to have been pretty well completed and I am surprised to find so many black-polls here this morning."

Once one has become familiar with the song of the black-poll, he is likely to find that its author is more common than would be suspected from the number of times that the bird is actually seen. Gerald Thayer in Chapman's "Warblers of North America" describes the main song of this warbler as follows: "Its song is a string of from six to twelve or more short and equally divided sibilant notes, cobweb-thin and glassy clear, uttered rather fast; the whole song smoothly swelling in volume to the middle and then smoothly falling off." Of course more or less deviation from this, the usual form of the song, often occurs. Whenever I hear this warbler singing my first impulse is to look for a bird that is in a hurry. Instead I find that the author is usually altogether leisurely and deliberate, at least for a warbler; it may be even calmly sitting on a twig while giving vent to its emotions.

One reason why the black-poll is so often overlooked is that during its migratory movements it usually keeps well to the tops of deciduous trees; moreover, it does not arrive until the foliage has attained considerable growth, which adds to the difficulty of seeing it. I have found that if I select a wooded tract on a hillside, I can, by standing on the higher part, view the tree tops that are practically on a level with my own eyes and so study the bird without so much physical effort and discomfort as otherwise might be encountered. The Emmons woods and the Catholic Cemetery at the edge of Oneida Lake, one-half mile east of the village of Cleveland, are two places in the region where this bird is found in numbers during the season and where it may be studied to advantage. I have often found the black-poll in the company of bay-breasted warblers in low trees along the lake and nearby creeks. On May 27, 1929, I found it in numbers in the low willows along Fish Creek near the village of Fish Creek Landing, and on May 29 it was common in a white birch and alder thicket one mile northeast of the village of Sylvan Beach.

The black-poll warbler occurs in all parts of New York as an abundant migrant and in summer it occurs in the highest parts of the Catskills and in the Adirondacks as a breeder. In the Oneida Lake territory the bird may be expected any time after May 10; a month later practically all have departed for the North. It is probable that by mid-August returning birds are passing through.

During the spring movement the female black-poll may be easily overlooked for, while the male has the black crown, grayish back streaked with black, and white under parts heavily streaked with black, the female lacks the black crown, the upper parts are grayish olive-green, and the under parts are white tinged with yellowish and streaked with black.

Western Palm Warbler. *Dendroica palmarum palmarum* (Gmelin).

In the Oneida Lake area this bird is surprisingly rare. In all my field experience here I saw it on only two occasions, both during the 1929 season. On

May 2, I saw a single individual in the Cicero Swamp southwest of Clay, and on May 11, another was seen in the low flat open district near the mouth of Chittenango Creek. Both these districts are low and swampy and large expanses of water lie immediately adjacent.

This warbler is a migrant in New York State and reports indicate that it is commoner in the western half of the State than in the eastern half. However, our two records for two seasons suggest that it is scarcely plentiful enough about Oneida Lake to be called "common." Its appearance here in spring dates from about May 1, and by May 15 it has moved on northward. It is probably more likely to be seen during the fall migration when it may be looked for in late September and early October. Large numbers of these birds winter in central Florida, and in the highly intensified farming districts about Sanford and Sarasota it is one of the most abundant and valuable insect feeders associated with the celery fields.

The palm warbler prefers open moist or marshy situations and will be seen frequently in low bushes or on the lower limbs of large trees. It is also highly terrestrial, and I believe that I have seen it on the ground more often than in trees. It has a habit of flirting or wagging its tail somewhat after the manner of the phoebe and pipit. This characteristic serves as an aid in field determination.

This warbler breeds mainly in the Canadian zone. Its nest is built on the ground, usually on swampy or moist land, among bushes or small trees.

Adults in breeding plumage: Upper parts olive-brown with a chestnut cap; a yellowish stripe over the eye. Throat, breast and under tail-coverts yellow; rest of under parts whitish.

Yellow Palm Warbler. *Dendroica palmarum hypochrysea* Ridgway.

On three occasions I have seen this palm warbler with *bright yellowish* under parts, in the Oneida Lake region: May 1 and 2, 1928, shore line, Lower South Bay; one individual on each date. May 2, 1929, edge Cicero Swamp, one-half mile southwest of Clay; one individual.

This form is a transient visitant in New York State, commoner along the coast than in the interior districts. It may be expected in the Oneida Lake region toward the end of April, and it probably leaves for the North by May 15. It appears to be rare here, as is also its near relative the western palm warbler.

Adults in spring much like the western palm warbler, but the under parts are entirely yellow, the streaks on the breast are reddish brown or rufous and the line over the eye is yellow.

Oven-bird. *Sciuurus aurocapillus* (Linnaeus).

This ground-inhabiting forest warbler is one of the most common and generally distributed summer residents of the hardwood and mixed forests in the Oneida Lake region. A summer woodland scene here would scarcely be complete without one or more of these loud-voiced songsters. The denser aspen thickets in old burns and cut-over tracts, particularly where the new growth has attained some height, also are visited frequently by this species. Its preferred habitats being

on the north side of the lake, the bird is commoner here than in the flat south-side area; but even on the south side, where hardwoods or low, swampy wooded tracts occur, the species is fairly well represented throughout the summer. Without doubt it is one of the dominant representatives of the summer bird fauna of the region.

Although my earliest records for 1928 and 1929 are May 5 and 6 respectively, I have no doubt that the oven-bird regularly arrives here during the last days of April. The autumnal movement to the winter quarters, which extend from South Carolina to northern South America, begins late in September and is completed in the early days of October.

While this bird is common all through the territory in question in early May, and its loud, ringing note is heard on every hand in the moist woodlands, it is not until about May 20 that the species attains its maximum of local abundance. During this time, too, its vocal efforts increase in vigor. After a trip to the hardwoods and mixed woods in the Lower South Bay district on May 17, 1928, I wrote as follows: "The oven-bird is very common in the dense woods where small pools of water and more or less boggy conditions prevail. It is singing enthusiastically and incessantly on all sides."

The Louisiana water-thrush frequents somewhat similar situations and the notes of the two birds are often heard at the same instant.

During May the oven-bird is well distributed in the deciduous woods—maple, beech, birch, oak and chestnut—particularly in the woodlands of the hilly or rolling country in the Kibby Lake district. As the season advances it disperses into the mixed hardwood and coniferous forest, and even into woods that are mainly coniferous; but many remain in the hardwoods. Dry, hilly cut-over and burned-over tracts such as found in the Thompson Corner, Constantia Center and similar districts also are favorite habitats. A few items from my June field notes will present the status of the bird somewhat more in detail.

"June 11, 1929. Particularly common, along with the Louisiana water-thrush, about the pools and mud flats in the McClanathan maple woods northeast of Sylvan Beach. The woods here are ringing with its loud, ventriloquial song.

"June 13, 1928. The oven-bird is fairly common in the deep hemlock woods two miles north of Cleveland. Since its arrival, I believe that it has, along with other species of warblers, including the black-throated green, retreated to the deeper, denser woods.

"June 15, 1929. In the denser part of the Vandercamp mixed woods on the Soule estate the oven-bird is common. In many places small pools of water still remain from the spring rains, and decaying, moss-covered logs are strewn about over the moist, well shaded forest floor. This bird favors such situations rather than the open places in the woodland where a considerable undergrowth has sprung up.

"June 25, 1928. The abundance and uniform occurrence of this bird in the dense moist hemlock-beech-maple woods in the Gordon Pond, Jewell and other higher north-side districts astonishes me. It is much less common on the low flats in the Shaw Point and Fish Creek Landing districts.

"June 25, 1929. Occurs and breeds in the moist hemlock woods two miles south of the village of Oneida Lake."

From the latter part of June and well through July, family cares largely occupy the attention of the oven-birds that breed in this territory. A field note of July 9, 1928, suggests the conditions in general at this time.

"Clay, Oak Orchard and Schroepfels Bridge districts. Saw several oven-birds in the rolling woodland north of Oneida River; one adult bird was carrying food, probably for young. While this bird is common in such situations its presence is now much less noticeable for, along with the bobolink, song sparrow and many other birds it has largely ceased those vocal activities that were such a marked feature in these woodlands three weeks ago. Now the teacher song is heard infrequently. Yet the loud, sharp '*chip*' of the adult birds calling or warning the young is often heard."

The oven-bird walks and runs much upon the ground and has a habit of jerking or jetting its tail as it pauses to pick up a bit of food or stops to listen. Although it often sings while on the ground, it usually mounts to a low limb of a tree. Not infrequently curiosity apparently prompts the bird to leave its hiding place among the leaves and bracken to investigate some disturbance in its domain, but as a rule the species is shy and retiring in its habits.

The song of the oven-bird is more or less ventriloquial. Its well known "teacher song" is often written as: "teacher, teacher, teacher, teacher, teacher," in the attempt to represent the enunciation and increased volume with each repetition.

The song is, however, subject to a good deal of variation both in accentuation and in number of syllables preceding or following the "teacher" series of notes. The persistency with which the oven-bird sings well into June is surprising. However, toward the close of that month we noted a definite cessation of song. A few field notes relating to this phenomenon as we observed it will be of interest.

"June 25, 1929. The oven-bird is not singing much now. It seems to be one of the first species to lose its vim in this respect, while the red-eyed vireo retains its ability throughout the summer.

"June 27, 1929. Oak Orchard district. Singing, but with diminished vigor.

"July 11, 1929. Woods two miles southwest of South Bay. Still singing, but with considerably diminished vigor and less frequency. The bird exhibits neither the volume nor the continuity of song that characterized it earlier in the season.

"July 19, 1929. Woodland three miles north of Bernhard Bay. Only occasionally heard now where it was commonly heard earlier in the season.

"July 21, 1928. Heard one singing in the woods north of Schroepfel's Bridge. The bird repeated the 'teacher' note only four times; and I did not hear it again.

"July 27, 1929. On an all-morning field trip from Cleveland to Bernhard Bay, Kibby Lake, Francis Pond and Constantia Center, we neither saw nor heard a single oven-bird. Its vocalizing has diminished remarkably within the last two weeks."

Another characteristic of the bird is that toward the end of the summer it becomes even more shy and retiring in its habits.

Although I have never heard it, its flight-song, or passion-song as it is sometimes called, is said to be even more melodious and voluble than its normal song.

The care which the oven-bird exercises in hiding its bulky nest at the side of an old log, under the margins of brush heaps or ridges of old leaves in the deep woods renders its discovery difficult. The roofed-over or dutch-oven shape of the structure—which is responsible for the common name of the species—effectively adds to its concealment. An aperture at one side of the oven provides a means of entrance and exit. Grasses, pieces of bark and dried leaves, with a lining of hair, fine grasses or pine needles make up the nest materials. Four or five whitish eggs spotted or blotched with reddish brown comprise the usual clutch.

The following field notes relate to breeding activities of the oven-bird in the territory in question.

"May 23, 1929. Vandercamp woods. Oven-bird in full song now. Mating was observed on May 21 and again today. In both instances the female was standing on a low twig of a tree in the deep, moist hemlock woods. Suddenly the male appeared, and, arresting his flight momentarily, sex union was effected as he half hovered over the female; whereupon his flight was resumed.

"June 20, 1928. Vandercamp woods. An adult carrying food.

"June 27, 1928. Hemlock, white pine and cedar woods two and a half miles north of Cleveland. Found a young oven-bird partly eaten by some animal, lying on the top of a large stump while two very much excited adult birds walked about in the vicinity. Evidently a bird tragedy had occurred here not long before. All circumstances pointed to the probability that the young bird had left the nest and, being unable to fly, had been attacked by a chipmunk or other animal.

"June 28, 1928. Vandercamp woods. Common everywhere. At the F. C. Soule estate a pair of oven-birds was feeding a young cowbird out of the nest, but unable to fly. One of the parents was particularly solicitous of the parasitic young and employed the broken-wing ruse to draw me from the scene. Even this ground-nesting species is not immune from the visitations of this avian outcast.

"July 3, 1929. This bird is common in the little frequented Parker woods southwest of Lakeport. The trees are mostly the deciduous type. They grow close together and the cool, damp forest floor is strewn with moss-covered branches and logs. This woodland is not frequently visited by humans and stock is not admitted. Here I found young oven-birds that had apparently been out of the nest less than twenty-four hours; they were zealously attended by their parents.

"July 20, 1929. Common; and feeding young out of the nest in the denser and damper part of the Widrig woods.

"July 22, 1929. A common bird in the low-lying woodland along Black Creek, east of Verona Beach, and in the high sparse woodlands of pitch pine and white oak adjoining. Saw one family of young just out of the nest and attended by the parents."

With an incubation period of twelve days (Burns, 1915, p. 286), the discovery here of young birds just out of the nest late in June and in late July as well, it appears that in some cases at least two broods may be reared in a season.

Most of the food of the oven-bird is gleaned from the forest floor, among fallen leaves and decaying vegetation which often forms a thick carpet there and hides a variety of animal life. According to Forbush (1929, p. 279), "The food of the Oven-bird consists largely of insects, small snails, slugs, myriapods, earthworms and spiders, together with some wild fruit and seeds. Among the immense number of insects taken are many plant-lice, caterpillars, both hairy and hairless, including those of the gipsy moth, other larvae, moths, butterflies, grasshoppers, crickets, weevils, click-beetles, leaf-beetles and other beetles, ants, flies, bugs, etc." Since it finds its food mainly on or near the ground and since its diet is so largely insectivorous the work of the oven-bird in destroying noxious insects supplements in an appreciable way the work of the arboreal warblers and other woodland birds.

The uniform olive-green upper parts, the broad golden brown stripe which extends over the whole top and back of the head and which is bordered on either side by a narrow black line, together with the white under parts heavily streaked with blackish on sides of throat, breast and flanks will serve to distinguish this bird. In addition, its terrestrial habits, its habit of wagging the tail and its distinctive voice are good field characters.

Northern Water-Thrush. *Seiurus noveboracensis noveboracensis* (Gmelin).

Although not a thrush at all but a terrestrial warbler inhabiting the vicinity of brooks and streams and swampy mud flats along the lake shores, this water-thrush is a fairly common transient visitant and summer resident in the Oneida Lake territory. Whether it is more or less common here than its congener, the Louisiana water-thrush, I can not definitely say, but my impression is that the latter is the more common of the two.

Early spring arrivals of the northern water-thrush may be expected in this territory late in April, and the movement continues for some time, numbers of the birds remaining to breed while others move on farther north. The autumnal movement to its winter quarters, which extend from Mexico through the West Indies to British Guiana, begins early in August.

In early summer as well as later in the season the northern water-thrush occurs on the low mud flats bordering Oneida Lake in many places, as for example at Shackelton Point, Lower South Bay and Baker Point. All these situations present similar conditions in that they support a sparse growth of grass and aquatic or semi-aquatic plants near the water, and a thicket of low willow and other vegetation is close at hand in which the shy and retiring bird may hide itself. Most of the places in which the bird occurs are not visited frequently by humans.

The swampy and boggy conditions in the extensive wooded lowlands all about Big Bay also offer suitable habitats, and in the low-lying, flat McClanathan woods northeast of Sylvan Beach this water-thrush occurs in numbers. In this last mentioned woodland pools of stagnant water are often found until mid-summer. Decaying sticks and stumps are scattered about promiscuously, and, where

a little sunshine beats through an opening in the trees, a heavy growth of ferns surrounds the pools (Fig. 140). The bird is found here throughout the summer. Also in the extensive wooded swamp in the Short Point district and in the vicinity of Mud Pond and the mouth of Chittenango Creek we have commonly found this swamp-loving recluse.

While the obvious differences between this and the following species are more or less apparent, it should not be supposed that the two occupy entirely different habitats for I have found both of them in the same general type of woodland throughout the summer. However, the present species seems to prefer the low, flat muddy habitats while the Louisiana water-thrush is more partial to the higher, rolling woodlands watered by streams of swifter current and more definite margins. This criterion of habitat distinction or preference is, however, not an infallible one for, as above noted, the two birds intermingle considerably here.

The northern water-thrush is a rapid and nimble walker and moves along in an easy stealthy manner, tipping its body and bobbing its tail up and down in lively fashion as it surveys the margin of a pool for food or hesitates at any untoward disturbance in its surroundings. On account of this peculiar movement of the tail, coupled with its fondness for the vicinity of water, this bird and its congeners are sometimes called water wagtails. Like the Louisiana water-thrush, the present species usually occurs singly or in pairs.

When moderately disturbed the northern water-thrush often flies to a low limb or the top of a stump or a fallen tree to view the surroundings. Under such circumstances its teetering movements are often splendidly displayed. It does not attempt to escape by ascending to the tree tops, but pursues a swift course through the woods, flying only a few feet above the ground.

One of the most conspicuous and pleasing characteristics of this bird is its loud, rapid and vehement warble. The great volume and penetration of this ringing song are out of all proportion to the small size of the singer. The lower pitch and faster time of this song will aid in distinguishing it from the similar notes of the Louisiana water-thrush. Saunders (1923, p. 328) writes the song as "*wit-wit-wit-wit-wit-wit-titititwit*" with the comment that it becomes "faster and lower in pitch toward the end." However, as is the case with most bird songs, a considerable amount of variation in its utterance is apparent, although at no time is the characteristic theme likely to be mistaken for that of any other species. In the early part of the summer this bird sings freely, but as the breeding season passes, its enthusiasm wanes and by early August it is heard only at infrequent intervals. The alarm note is described by Chapman (1914, p. 463) as a sharp, steely "*clink*," which is not so penetrating as that of *motacilla*.

Although I have no actual records of nests of the northern water-thrush for this territory, I feel sure that it breeds here. The presence of the bird all through the summer in the type of nesting habitat to which it is partial, lends support to this belief. Concerning the nesting of this species in Potter Swamp, which lies in Ontario and Yates counties, C. F. Stone in Eaton's "Birds of New York" (Part 2, 1914, p. 440) writes as follows:

"They have full sets of eggs as early as May 4, and nesting begins, some seasons, as late as June 10, the average time, however, is from May 15 to June 1. The nests are invariably snugly hidden in thick beds of moss at the bases of trees or stumps or decayed moss-covered logs, and rarely in the roots and dirt of upturned stumps, anywhere from the level of the damp ground to two feet above the stagnant pools of water. The mossy nest is formed from the bits of moss that are pulled out when the cavity is made in the bed of moss, and the lining is of the reddish moss stems. The eggs are four or five, decidedly smaller than those of the Louisiana water thrush. . . ."

Of the situations that I have seen in the Oneida Lake region, which most closely simulate the above described conditions, the McClanathan woods and the Big Bay Swamp are the most likely nesting places of this bird, and with careful search I believe that nests could be found in both of these localities, and perhaps others, in the proper season.

From the meager published accounts of the food habits of this bird it is evident that aquatic insects, worms, mollusks and larvae make up the bulk of its diet. Warren (1890, p. 295) says that its "food consists largely of beetles; small worms, larvae, and small shells are also frequently eaten."

Upper parts plain uniform olive-brown. Under parts yellowish white or light sulphur yellow heavily streaked with blackish; throat also streaked. A yellowish or buffy line over the eye.

Louisiana Water-Thrush. *Seiurus motacilla* (Vieillot).

The Louisiana water-thrush or large-billed water-thrush is even more of a woodland bird than is the northern water-thrush, although it frequents the same habitats as that species. However, I believe that the present form is partial to the dense rolling woodlands watered by small streams rather than to the low flat shore lines and swamps. It appears to be commoner here than the northern water-thrush.

The Louisiana water-thrush is one of the first warblers to arrive in spring, its time of appearance averaging somewhat earlier than that of the northern water-thrush. It may be expected about mid-April. The autumnal movement to the winter quarters, which extend from Mexico and the Bahamas through the West Indies to Colombia, begins and, in this section, usually is completed in the month of August but may extend into September.

Throughout May, the Louisiana water-thrush though shy and loath to show itself, is a prominent member of the bird population of most of the dense and moist wooded tracts in the region, its ringing melody vying with that of both the oven-bird and northern water-thrush for recognition. Often the singer chooses a perch in a tree from which to send forth its music, but I have sometimes seen it singing from a log or other slight elevation. Its song is similar to but even louder and more variable than that of the water-thrush. Concerning its vocal ability, Chapman (1914, p. 464) writes: "As a songster the Water-Thrush is without a rival. His song is not to be compared with the clear-voiced carol of the Rose-breasted Grosbeak, the plaintive chant of the Field Sparrow, or the hymnlike melody of the true Thrushes; it is of a different kind. It is the

untamable spirit of the bird rendered in music. There is an almost fierce wildness in its ringing notes. On rare occasions he is inspired to voice his passion in a flight-song, which so far exceeds his usual performances that even the memory of it is thrilling."

Although this bird is exceedingly vociferous in spring and early summer, it seems to be one of the first to lose its singing ability, or at least to cease exercising it, for by mid-July it sings only in a half-hearted manner and at long intervals. While I have heard it sing as late as August 1, the voice at that season does not have the ring and vital qualities that were so apparent six weeks earlier.

Among the places about Oneida Lake that seem to be particularly attractive to the Louisiana water-thrush may be mentioned the woods south of the Syracuse Yacht and Country Club, the Short Point swamp district, Muskrat Bay district, Cicero Swamp south of Clay and the Kibby Lake, Gordon Pond, Cleveland, Jewell and Oakland Beach districts. The latter in particular is a favorite retreat as are also the Steding and other densely wooded areas lying well to the south of the lake. Thickly wooded maple, ash and elm swamps also are favorite haunts of this bird and it occurs in numbers in such situations on the west side of Big Bay and north of the Emmons woods. Indeed this warbler is one of the common woodland birds of this region where, if it and its close relatives, the oven-bird and the northern water-thrush were removed, a conspicuous void in the numbers of the local bird population would be apparent.

Ordinarily this warbler is shy and easily flushed. During the nesting season it is not often seen in the open. When frightened it makes off through the woods with low, swift, somewhat erratic flight, but when undisturbed it walks along in a light easy manner with a springy, teetering movement of the body and a wagging of the tail.

The Louisiana water-thrush undoubtedly breeds freely in the Oneida Lake region. While I have no definite observations on the nesting habits proper, aside from the occurrence of the bird here throughout the summer, I have only one bit of additional evidence to offer in substantiation of this statement.

Ordinarily the adults are wary and remain well concealed, but when danger threatens their young they disregard their own safety in their anxiety for the welfare of the offspring. On June 25, 1929, I found a pair evidently breeding in a low boggy part of the Steding woods, two miles south of the village of Oneida Lake. This is a mixed woodland, very dense in places; a creek flows through it, and shallow pools of water occur here and there. One of the adult birds was carrying a mayfly and although I found no nest or young, I feel sure that the birds were nesting there. They were very much excited at my presence and one of them came within six feet of me as it walked in a kind of sneaking and half-crouching manner over the leaves and black mud of a small pool of water. On a twig above me the male was singing in a low voice. To me, it seemed that the song was uttered in excitement and in an effort to distract my attention rather than for any other purpose.

The bulky nest is said to be made commonly in the steep bank of a wooded stream under a mossy ledge, in cavities about the bases of trees or among the

roots of fallen trees. Leaves, moss, twigs, grass stems, rootlets and pine needles comprise the bulk of the usual nesting materials. Five grayish white eggs variously marked with brownish and lilac comprise the ordinary clutch. C. F. Stone (in Eaton, 1914, p. 444) says of the nesting habits of this bird in the Keuka Lake [Yates County] region: "Normally, the nesting period extends from May 4 to May 30. . . . I consider all fresh June sets second attempts at nesting owing to accidents with the first nests."

Although no detailed studies of the food habits of the Louisiana water-thrush appear to have been made, it seems likely that the diet of this member of the family is similar to that of the oven-bird and the northern water-thrush both of which frequent more or less similar habitats. Concerning the diet of the present species Barrows (1912, p. 633) says: "The food consists mainly of aquatic insect larvae, but insects and spiders of various kinds are eaten, as well as worms, crustaceans, snails and other mollusks, and to a lesser extent various seeds and small fruits."

Upper parts plain uniform dark brown. Under parts white washed with buffy, heavily streaked with blackish except on throat and middle of belly. A white stripe over the eye. Distinguished from the northern water-thrush by the larger bill, the white instead of yellowish line over the eye, the white under parts and unspotted throat. The absence of the orange crown will serve to distinguish it from the oven-bird.

Mourning Warbler. *Oporornis philadelphia* (Wilson).

The mourning warbler seems to be well distributed in the Oneida Lake region, but common nowhere. I came across it more frequently in bushy tangles, near or in wooded sections, than elsewhere. My earliest record is May 21, 1928, when two individuals were observed in the Little Bay woods. I believe, however, that the bird may be looked for in the region at least ten days earlier. During June I have found this warbler on the west side of Chittenango Creek, near its mouth, and at several points in and adjoining the hemlock and mixed woods on the north side of the lake.

Although I have found no nests of the mourning warbler in the territory, I am satisfied that it breeds in the Maple Flats, Vandercamp woods, Jewell and Panther Lake districts, for in all of these places I found singing males between May 27 and June 28. These males seemed to exhibit a fondness for a high, conspicuous perch from which they might pour forth their loud, clear and melodious whistling song, "*tolee tolee tolee tootletoo*" (Saunders, 1923, p. 281). The voice rises on the first three notes and falls on the last two.

On May 27, 1929, in a partially cleared area in the maple-hemlock-birch woods just north of Jewell, I came upon a singing male. As has been characteristic of all of this species that I have seen, this one was shy and suspicious and kept well to the tangle of blackberry bushes and maple and birch seedlings; but occasionally mounted to the top of a tall tree to sing. At Panther Lake on June 6 and 7, 1929, I saw a pair in heavy undergrowth in an opening in dense mixed woods.

On June 18, 1928, near the Maple Flats Baptist Church I came upon a male singing in roadside thickets; at frequent intervals he flew up to sing on

the limb of a near-by tree. At that time I described the song as a "loud," more or less warbling type of whistle." For the most part, the bird kept well to the undergrowth where the Maryland yellow-throat also was seen. Again on June 25 and 28, I found a male singing lustily and persistently from the branches of a tall maple situated in a bushy and brushy clearing at the edge of the Vandercamp mixed woods near Cleveland.

All the situations just mentioned are likely breeding places, and I should not have been surprised had I found a nest in any of them after May 25. The nest, well hidden, is placed on or near the ground, usually although not always in moist situations. The complement of eggs is four or five. Eaton (1910, sec. 4) records the species as nesting in all four counties surrounding Oneida Lake.

This is one of our handsomest warblers, the male having a bluish gray head and neck, the bluish gray on the throat gradually changing to black on the breast; belly yellow; upper parts olive-green. Female similar, but paler on head, neck and throat; also paler both above and below.

Northern Yellow-throat. *Geothlypis trichas brachidactyla* (Swainson).

The many moist, swampy thickets in the Oneida Lake region furnish excellent habitats for this warbler. It is accordingly one of the most abundant summer resident and breeding birds in this territory. Among all the warblers it probably is exceeded in numbers only by the eastern yellow warbler, and possibly by the redstart.

Early spring arrivals may be looked for in this territory late in April, but the peak of local abundance is not reached until about May 20. My own earliest date is May 2, 1929, when several birds were recorded from the Cicero Swamp southwest of Clay. Throughout the summer this warbler is widely dispersed in the thickets along the small streams and about the ponds and lakes and roadsides, in the low-lying margins of wooded areas, about Oneida Lake itself and even in gardens where these are situated on the border of swampy tracts. The southern movement to winter quarters which, in the East, extend from North Carolina through Florida and the West Indies to Panama, begins in September and by mid-October practically all the birds have left this territory.

An enumeration of the situations in which we have found the northern yellow-throat in this territory would include practically every locality visited; and the frequency with which it occurs is indicated clearly in our daily list of species observed. A few selected excerpts from my field notes, in chronological sequence by months, will set forth certain items of local interest concerning the distribution, habits and behavior of the bird.

"May 9, 1928. Short Point, adjoining swamp and vicinity. The Maryland yellow-throat is a common inhabitant of the willow thickets at the edge of the swamp, where it occurs mostly near the ground. It does not walk about much, but is continually flitting and hopping through the low vegetation in search of food. It has not begun to sing. Within the past forty-eight hours this species, the yellow warbler and the swamp sparrow have become notably more abundant here.

"May 17, 1928. Lake shore and fields, vicinity of Lower South Bay. A common bird in the willow and aspen bushes along the border of dense woods, and even found some little way into the woods. The birds are singing freely now and their ringing 'wichity, wichity, wichity' is heard on all sides. This song seems to be more varied and of greater power in the eastern than in the mid-western representatives of the species.

"May 21, 1929. Common in the willows and alders in the Constantia Bay and Baker Point districts. On one occasion here I saw a male dart upward from his perch on a willow twig and break into full song, then come fluttering down to his perch again, singing throughout the flight. The song did *not* consist of the wichity ditty so characteristic of the species, but of a series of low, melodious, warbling notes. Evidently this was a mating display put on for the approval of an admiring female.

"May 26, 1928. Not as common in the Cicero Swamp as along its bushy margins.

"May 28, 1928. Hitchcock Point and mouth of Chittenango Creek. Among the warblers, the northern yellow-throat was surpassed in numbers here this morning only by the yellow and possibly also the black-poll warblers. It was particularly well represented in the low thickets adjoining the woods.

"May 29, 1928. Lower South Bay to Short Point. I believe that this bird ranks second in point of numbers among the warblers, at least on the south and northwest sides of Oneida Lake, while in the wooded sections about Cleveland and Constantia it must concede first place to the redstart.

"May 31, 1928. Cicero Swamp two and one-half miles south of Bridgeport. The bird is in full song now and very common here; also at Shackelton Point.

"June 1, 1928. A very common bird about swampy places in the Muskrat Bay and Phillips Point districts. Found it feeding on the ground in swampy woodland among a dense growth of ferns (*Pteris*). The birds frequently hopped up to pick off an insect from the upper or under side of the fronds. On examination of this foliage where the yellow-throats had been feeding I found great numbers of small mosquito-like, two-winged flies (Diptera). Evidence indicated that the birds were feeding upon these insects.

"June 14, 1928. Jewell district. Fairly common in the shrubby margins of open fields near the lake, at the edges of moist woodland and in alder thickets. Saw a male fly outward and upward from a shrubby fence row near the lake, give the characteristic wichity note three times while in the air and then return to the shrubbery. Presumably this was a nuptial performance. If so, the song at least is subject to a great amount of variation.

"June 14, 1929. A few birds about the smaller mixed vegetation toward the edge of the Cicero Swamp, but more in the cat-tail growth in the heart of the swamp.

"June 15, 1928. Even in the shrubby growths in moist places along the edges of fields in the Cleveland, Bernhard Bay, Kibby Lake and Constantia districts, this bird is common. Alder thickets are one of its favorite strongholds.

"June 20, 1928. Not so common in the Vandercamp woods and adjoining wooded sections.

"June 26, 1928. Fish Creek Landing and vicinity. A common bird here in bushy places along Fish Creek and about the edges of ponds. It is one of the commonest and most generally distributed warblers of the region.

"June 30, 1928. Oakland Beach. More abundant in this vicinity than I have observed it elsewhere in the territory. The low shrubbery growing in the cut-over places along the margin of the woods offers safe retreats and suitable nesting places. The concentration of the species here in this brushy and bushy low, flat, boggy area is very marked and I was greeted on every side by the notes of the singing males as well. Several individuals were carrying food for the young. The birds are shy and when alarmed dart into the shrubbery, there persistently to utter their alarm call '*chit, chit.*'

"July 11, 1929. Common in low-lying bushy growths at the Parker woods, in the woods two miles southwest of South Bay village, and along bushy fence rows in the vicinity of Whitelaw.

"July 13, 1928. Abundant in low bushes and willows in the Shackelton Point and Hitchcock Point districts. The young are out of the nest in numbers now and the low, sharp, warning '*chit*' of the adults is heard everywhere.

"July 28, 1928. Fairly common northwest of Jewell and about the swamp near the Fish Creek railroad station. Still singing.

"July 30, 1928. Not so conspicuous now for it seems to have lost some of its inquisitiveness and has become shy and retiring. Sings very little now.

"August 1, 1928. Both young of the year and adults visit freely the blueberry thickets in the Cleveland, North Bay and Jewell districts, but the adults do not sing much now.

"August 7, 1929. Visited the Cicero Swamp south of Clay, in late afternoon and evening. During the four hours spent here we heard the northern yellow-throat only a half-dozen times and then not until well toward dusk. Three weeks ago it continued its singing here until after dark. The marked diminution of its vocalization at this season is one of the notable features in the life of the bird here.

"August 10, 1928. The northern yellow-throat is a fairly common bird in the low bushes along Three Mile and Big Bay creeks in the Big Bay Swamp. Many young of the year here. The bird is still singing although without the enthusiasm and vigor that characterized its efforts a few weeks ago.

"August 12, 1929. Verona Beach and Fish Creek Landing. Seldom see or hear the bird now.

"August 13, 1928. Verona Beach and Fish Creek railroad station districts. Saw less than a half-dozen northern yellow-throats all day. Heard the wicity song only twice."

The above records will give some notion of the prevalence of the northern yellow-throat in the Oneida Lake region, and of the very noticeable change in its behavior as the season advances, from an enthusiastic and voluble songster to a retiring and almost voiceless creature—within the space of a few short weeks.

Of course the northern yellow-throat breeds in numbers in the territory. Its nest is usually placed on or near the ground in swampy thickets or among weeds or in clumps of grass near water. Bushy fence rows are often chosen as nesting sites, and almost any sort of tangle near water is not without its appeal to this bird. Dead leaves, grass and strips of bark together with finer grasses and rootlets comprise the principal nest materials. The usual complement of eggs is four; they are whitish, irregularly marked with some shade of brownish. Sadler (1926, p. 17) records a nest under process of construction at Cross Lake on June 2, 1924. I have no actual records of nests here, but on June 18, 1928, I saw an adult carrying food and thus affording evidence of the presence of young in the nest. From this time on to late July, the sight of adults carrying food and of feeding young of the year that had left the nest was a common one. Indeed, with an incubation period of but twelve days it seems altogether likely that two broods are commonly reared in a season here. The young birds apparently depend upon the parents to feed them for an unusually long time after they have left the nest. The parents in turn show considerable solicitude for their offspring, even after the latter are able to fly well, and in late July, particularly, are often seen feeding their young in roadside thickets.

A field note of July 20, 1928, illustrates the situation at this time. "Lower South Bay, Bridgeport and North Manlius districts. In roadside bushes at the margin of woodland three miles south of Bridgeport. Saw a male northern yellow-throat feeding a young one out of the nest and able to fly a little. Observed and heard the yellow-throat in other places in this district, which offer suitable conditions for nesting along the bushy banks of streams, and roadsides. This entire district is low and flat, affording just the type of habitat that appeals to this bird. Also in the bushes along the Oneida River near Oak Orchard the parents are busy feeding young out of the nest. This species and the redstart are among the last if not the last of the warblers still engaged in this duty." On July 22, 1929, in a willow and blueberry thicket along the railroad track a mile northwest of Cleveland, adults were carrying food—mostly mayflies—to feed young out of the nest.

After mid-July both adults and young of the year congregate more or less about the extensive blueberry thickets in the Cleveland and other districts. Just to what extent the birds feed upon blueberries I do not know. At the Delahunt woods, a favorite resort of this type, I found the northern yellow-throat common on July 18, 1929. Here I saw several young out of the nest, adults carrying food for young and one adult carrying a pellet of excrement in its bill, indicating that young were still in the nest at this late date.

As late as July 27, I have seen males feeding young that were practically full grown. Evidently the males take an important part in the care of the young birds, for we have consistently found them carrying food throughout the breeding period.

The abundance of the northern yellow-throat and its habit of visiting a diversity of situations in search of food, together with the type of food that it selects, renders this warbler of more than ordinary value from an economic

viewpoint. Concerning its food habits, Forbush (1929, p. 298) says: "It is particularly fond of cankerworms, for which it scours the orchard; it eagerly eats fall web-worms, and destroys immense numbers of many other destructive caterpillars, including those of the gypsy moth; grasshoppers and leaf hoppers bring the bird to the fields, where it makes of these insects important articles of diet, while plant-lice, flies and beetles help to appease this bird's voracious appetite. Its menu contains also such delicacies as grubs, small moths, spiders, ants and the larvae of many insects, all of which it consumes in considerable quantities."

Adult males are easily recognized by the dark olive back, the bright yellow throat and the black mask bordered above by gray and below by whitish. The adult female and the young lack the mask, but may be distinguished by the yellowish throat and breast, the buffy-white belly washed with brownish on the sides, and the yellowish under tail-coverts.

Hooded Warbler. *Wilsonia citrina* (Boddaert).

Not until June 3, 1929, was this strikingly colored warbler, with its no less distinctive though variable song, seen in the territory. My attention was first drawn to the bird by its song "*che-reek, che-reek, che-reek, chi-di-ee*" or *terwee terwee terwee tee too*." (Saunders, 1923, p. 293.) The first three notes were clear, loud and bell-like, the others accelerated, with the next to the last one high-pitched and markedly accented. The song gives to the listener the impression that it emanates from a bird of more than its 5.6 inches in length.

While undisturbed the individual in question was singing in the lower undergrowth of a mixed woodland, somewhat open and composed of tall maple, beech, wild cherry and small to medium hemlocks, at the Louis Will Game Retreat and Breeding Ground near Frederick Creek. This property is included in a tract of about 1,000 acres, mostly grown up in hardwoods and conifers, located about three miles northeast of Constantia. Maple, elm and beech saplings together with some ferns and high-bush blackberry comprised the principal part of the undergrowth. Small piles of dried brush lay here and there, and in places dead leaves formed a thick covering on the forest floor. Several years ago when this particular tract was used as a breeding ground for introduced birds it had been partially cleared, and enclosed with a high woven-wire fence. More recently these breeding experiments have been discontinued, the fence is falling into decay and the reverting woodland growth affords suitable protection for several species of native birds and a likely habitat for the hooded warbler.

Occasionally while singing, which it did intermittently during the half-hour that I stalked it, this warbler flew from the undergrowth to a perch on the lower limb of a tree or to the bough of a small hemlock.

But it was very shy and did not remain thus exposed for more than a few seconds at a time. Although it did not move far from the point where I first saw it, the bird continually changed its location so that I was forced to view it at the distance of about twenty yards. During its movements through the undergrowth the male that I watched seemed to be accompanied by another bird, probably a female, of which Mrs. Stoner caught a fleeting glimpse on one occasion.

Again on June 6, 1929, in the mixed woods 400 yards north of Panther Lake, I came upon two more individuals of this species, in maple sapling and high-bush blackberry undergrowth. Both birds sang intermittently and remained well down among the bushes. The surroundings here also offer favorable nesting sites for this elusive bird. When I visited the locality again the next day, June 7, the birds were still there. This lends some strength to the notion that they may nest in this district.

This fine warbler seems to be of rare occurrence in the southeastern part of the State, while in the interior its distribution is more or less local and irregular. However, several records of the nesting of the species are reported for Madison County, and Sadler (1926, p. 18) reports it as nesting near White Lake, Onondaga County, June 30, 1919. While the present records of its occurrence in Oswego County on June 3, 6 and 7 scarcely establish it definitely as a breeding species, it is altogether likely that its presence here at this late spring date is indicative of nesting. It cannot be a common bird in the Oneida Lake area or it would have been seen during our field work of 1928. The species commonly arrives in central New York between May 1 and 10.

Mature mixed woodland of beech, maple, cherry and ironwood in close proximity to water and with a sizable undergrowth of saplings and miscellaneous bushes, provide the favorite habitat of this warbler. It has a habit of flitting quickly from one low perch to another, at which times its conspicuously white outer tail feathers and the black hood of the male together with the bright yellow under parts are displayed to marked advantage and serve to provide easy and certain field determination.

Bushy, well-watered woodlands and hillside thickets are the favorite nesting retreats of the hooded warbler. It commonly builds its nest in a bush or sapling at the height of one to five feet from ground or water. Dry leaves, strips of bark, grasses and rootlets make up the principal nest materials. The usual clutch of eggs is four. They are white, spotted and marked with chestnut, purplish and lavender.

Wilson's Warbler. *Wilsonia pusilla pusilla* (Wilson).

This little warbler seems to be of rather uncommon occurrence in the Oneida Lake region. I have seen it only in the Hitchcock Point district, near the mouth of Chittenango Creek, in early June. There I found both males and females along the flat, grassy creek banks, in low willow and alder bushes. I should expect the species to be more common and generally distributed than my information indicates and that it would be found—although perhaps sparingly—in other suitable localities, particularly in the Constantia and Sylvan Beach districts.

So far as I am aware Wilson's warbler is found only as a migrant in New York State, the spring migration occurring between early May and mid-June while the autumnal movement begins with the second week of August and continues to early October. Eaton (1914, p. 461) calls attention to the irregularity in abundance of this species in a given locality, from season to season, and to the fluctuation in its local status from time to time. My own observations in the

Oneida Lake region thoroughly bear out these statements. However, it seems that the black-cap is not a generally common bird in the southeastern and central portions of the State, and while it is of regular occurrence in the central and western portions its abundance varies from season to season.

Low shrubbery, bushy thickets and undergrowth at the edge of woodland and near water form the favorite haunts of this alert, fly-catching warbler. The Hitchcock Point district is a typical local habitat.

Wilson's warbler "Breeds in Boreal zones from tree limit in northwestern and central Mackenzie, central Keewatin, central Ungava, and Newfoundland south to southern Saskatchewan, northern Minnesota, central Ontario, New Hampshire, Maine and Nova Scotia; winters in Central America from Guatemala to Costa Rica. . . ." (A. O. U. Check-list, 1910, p. 325.)

While the adult male bird is olive-green above, yellow below and has a black crown, the female is less brightly colored and the black cap is inconspicuous or altogether lacking. Some difficulty may be encountered in satisfactory field differentiation among the females of Wilson's warbler, the yellow warbler and the Maryland yellow-throat. However, the female yellow warbler has yellow on the inner vanes of the tail-feathers, a character lacking in both the other species while the female Maryland yellow-throat has the throat and breast yellowish, but the belly is whitish.

Canada Warbler. *Wilsonia canadensis* (Linnaeus).

This handsome warbler—one of the exceptions among the members of the family in that it is a good songster—is a fairly common summer resident in the Oneida Lake region. During the early part of the season it mingles freely with other species of warblers in woodland, about houses and even in the towns and villages; but as the time for nesting approaches it concentrates in the cool, damp thicketed portions of the forests near bogs and streams, in alder copses or in old burns covered with a tangle of undergrowth and carpeted with a layer of moss. Again, the moist wooded and shrubby sections to the north and east of Oneida Lake claim the largest proportion of these birds as summer residents, for it is here that favorable breeding habitats are most numerous.

The Canada warbler does not appear here as early in spring as some of its relatives. My earliest record for the 1928 season is May 16, and for the 1929 season, May 25. I believe that the former date is about average for this region and that the species seldom arrives here before May 10. By June 1, those that nest in the Adirondacks and at points farther north have gone on, leaving only the summer residents to represent the species in this territory. In mid-August or even a little earlier the local population is again joined by the birds returning from the more northern breeding grounds and by early October most of the Canada warblers have left for their winter quarters in Central and South America.

Records of Maxon, Embury and others indicate that twenty-five years ago the Canada warbler was considerably less common as a summer resident in this territory than it is today.

By way of indicating more in detail the local status, mode of occurrence and certain characteristics of this warbler I will quote from my field notes. It will be observed that the bird seems to be most common in low, open, moist woodlands supporting a dense covert of shrubs. Alder thickets form one of its favorite retreats.

"May 20, 1929. Cleveland district. The Canada warbler daily becoming commoner and now its broken, energetic song is heard on all sides in low, wet woods, especially along alder-bordered streams.

"May 26, 1928. Cicero Swamp, three miles southwest of Lower South Bay. Common here and in full song. The moist thickets offer an abundance of suitable nesting sites.

"May 29, 1929. Common in a white birch and alder thicket one mile northeast of Oakland Beach, and also occurs in numbers in the low, swampy woods just east of Verona Beach.

"May 31, 1929. The commonest warbler in low alder thickets along the small streams in the Cleveland and Gordon Pond districts.

"June 3, 1929. Occurs everywhere in the moist thickets in the Cleveland district, but not as common on the higher ground near Panther Lake. The low, boggy portions of the woodland that support growths of alder and willow are its favorite retreats.

"June 10, 1929. The commonest warbler in the low, boggy alder and willow thickets in the woods north of Cleveland; it is generally distributed, too, within the limits just mentioned.

"June 11, 1928. In alder thickets, west side, near the mouth of Chittenango Creek.

"June 11, 1929. Verona Beach district. Common in the aspen and blueberry thickets on boggy ground a half-mile east of the beach. I believe that it breeds here, but could find no nests in the moss-covered situations that I examined.

"June 16, 1928. Hemlock, beech and maple woods one-half mile north of Jewell and North Bay woods. Canada warbler not particularly common; usually see two or three birds in the course of an hour. Alder thickets are its favorite retreats.

"June 18, 1928. On a field trip today that included the Cleveland, Gordon Pond, Jewell and Vienna districts we found this bird to be generally distributed but not particularly common anywhere.

"June 21, 1929. Hemlock and cedar bog seven miles southwest of Lower South Bay. A male singing; the species is probably nesting in the moist low-lying woods here that are watered by a small creek.

"July 9, 1928. Saw several and heard others in the low boggy part of the wooded section a mile north of Schroepel's Bridge. The bird is common and I believe it breeds here. Several individuals that I saw seemed much excited over my presence, but I found no nests.

"July 24, 1929. Saw several of the birds this morning in the low bushes in the vicinity of bogs and streams north of the village of North Bay.

"August 4, 1928. Sylvan Beach district. In the boggy alder and blueberry thickets east of the village, found this to be a very common bird; present in

greater numbers than I have found it elsewhere in the region. Birds of the year and possibly also some additions from more northerly breeding places no doubt have swelled the local numbers. The birds were singing gayly, the characteristic '*chip, chippery, chippery, chippery, chee-teh, chee*' (Silloway, 1920, p. 94), with some variations. The variety of song and the persistency with which the bird sings is amazing."

Sufficient evidence has been submitted to indicate that this warbler is well distributed in the low wooded thickets of stream borders and that it is commoner in the territory lying to the north and east of Oneida Lake than in the other parts of the territory covered. As Eaton suggests (1914, p. 464), this is "not a warbler of the dense woodland, but prefers an open growth of trees with a dense undergrowth of vines and shrubbery."

The Canada warbler is an active nervous creature; it is shy and retiring and usually remains hidden in its selected haunts from the depths of which its loud, warbling song is delivered. The rendition of this song is subject to considerable variation, but it has a wild, carefree and reckless tone that distinguishes it readily from that of any other bird. Even as late as July 26, I heard males singing in as full and rich a tone and with as much abandon as at any time during the breeding season. While in late summer the bird does not utter its lay as persistently as it does up to July 15, it is likely to burst forth into song especially when it is excited or its haunts are disturbed. Even as late as August 7, I heard it singing enthusiastically in the Cicero Swamp. When its precincts are invaded it utters a loud, harsh "*chip*."

Although I found no nests of the Canada warbler I obtained good circumstantial evidence that it breeds in the region. Its presence in numbers in many of the localities above mentioned, all through the summer, is suggestive but the presence in numerous situations of young birds just out of the nest is practically conclusive. A few field notes bearing upon this point will be of interest.

"June 23, 1928. Hemlock woods half a mile north of Jewell. Saw a female carrying food for young.

"June 25, 1929. Hemlock-maple-birch woods two miles south of the village of Oneida Lake. Young just out of nest and attended by parents. Also saw other adults carrying food for young.

"July 11, 1929. At the Parker woods south of Lakeport, saw young not long out of the nest.

"July 16, 1929. In low woods a mile east of Verona Beach, saw a male carrying food, a mayfly. Upon investigation of the surroundings, the adults became much excited, but I was unable to find either a nest or young birds.

"July 16, 1928. In Sauers' woods south of the West Monroe Cemetery, Mrs. Stoner saw an adult male attending young out of the nest that were able to fly a little.

"July 21, 1928. Several males, females and young in a wooded ravine two miles north of Schroepel's Bridge, where I found the species well represented on July 9.

"July 22, 1929. One of the commonest warblers in the woods east of Verona Beach. Saw several adults feeding young out of the nest.

"August 6, 1929. Edge of woods one mile north of Jewell. Young out of nest, attended by parent.

"August 7, 1929. Low, bushy, white birch and alder thickets along Black Creek east of Verona Beach. Adults and young of the year. The black necklace just beginning to show on the young birds."

The nest of the Canada warbler is usually built on or near the ground in moist thickets and is well concealed by the surrounding vegetation. Dried leaves, grass, moss and strips of bark usually comprise the bulk of the structure, with a lining of rootlets or hairs. Four or five whitish eggs spotted with reddish brown make up the usual clutch and, according to Eaton (*loc. cit.*, p. 464), are deposited between June 1 and 20. Our observations here indicate that the maximum abundance of young not long out of the nest occurs about July 1 and assuming that the period of incubation is twelve or fourteen days, it is evident that a majority of the eggs are deposited during the first week of June.

Like its relatives, the Canada warbler feeds on insects to a considerable extent, and it plays some part at least in holding in check forest and shrub inhabiting forms. "It indulges its eager appetite on winged insects, such as mosquitoes, flies and moths, while beetles, small hairless caterpillars and spiders also form a part of its fare." (Forbush, 1929, p. 309.)

Males: Upper parts, wings and tail bluish gray; loreal stripe and eye-ring yellow. Under parts yellow with a prominent necklace of black spots across the breast. Female: Similar, but paler and with the necklace less conspicuous.

American Redstart. *Setophaga ruticilla* (Linnaeus).

This small, attractive warbler is not only one of the commonest representatives of the family in the Oneida Lake region, but also one of the commonest summer residents in this territory. While it keeps well to the deciduous woodlands and confines its activities mainly to the higher parts of the trees, its abundance compensates in some measure for the restricted area of operation. Situations such as are frequently chosen by the red-eyed vireo and oven-bird also attract the redstart; it does not readily establish itself in close proximity to human habitations or activities. It is evident that the wooded sections lying to the north of Oneida Lake are the centers of its local abundance during the summer.

In this territory the first spring arrivals are likely to appear about May 1, the males usually some days in advance of the females. My earliest date for the species is May 3, 1929, when two males were observed at Hitchcock Point. My first record for the season of 1928 was May 4, when a male in full song was found in this same locality. Not until May 9, 1928, and May 11, 1929, was a female recorded. At that time the males had increased in numbers, so that the dearth of females was pronounced. Similar conditions prevailed in the season of 1929. The autumnal movement to the winter home, which extends from the West Indies and central Mexico to northern South America, is begun and largely concluded in September.

During the early part of May the redstart is well distributed not only in the woodlots of deciduous trees such as the Emmons, Van Antwerp, Parker and similar localities, but also in the taller maples and other scattered deciduous trees about the shores of Oneida Lake. As the season advances it retires more definitely to the hardwoods and mixed woods where it becomes one of the commonest and most conspicuous species of summer birds. Here its status among the arboreal species corresponds to the status of the oven-bird among the terrestrial forms.

Of the twenty species of warblers observed in the Big Bay woods on May 21, 1928, the redstart was one of the most abundant, challenging the Maryland yellow-throat for superiority in numbers; and two days later, in the mixed woods in the Lower South Bay district, it was the commonest of the twelve species of warblers observed. The Sauers woods, the Cicero Swamp south of Bridgeport and practically all the woodlands north of Constantia, Cleveland, Jewell and North Bay, and even those on Dunham Island, become congregating places for the redstart. The extensive white birch and alder thickets a mile northeast of Sylvan Beach also attract the redstart. Indeed, by June 1, the species becomes so thoroughly a part of the low and moist as well as the higher deciduous and mixed woods everywhere, that its presence is taken as a matter of course. Its shrill note reaches one from all sides.

However, I believe that the redstart is somewhat less common in the low maple and elm woods, such for example as those at Shaw Point, than it is in the beech-maple-hemlock woods on higher ground. In the Muskrat Bay district, also, the bird was markedly less common among the maples and elms on the low, boggy flats than in the tall maples on the highlands where a thick growth of saplings and small trees occurs. While, within certain rather wide limits, the local distribution of the redstart is more or less circumscribed, the fact remains that it is one of the most common summer residents of this territory.

This warbler is very alert and active, continually fluttering about among the foliage of the trees in pursuit of flying insects, and displaying its plumage. Its habit of carrying wings and tail partly extended serves to accentuate the contrast between the black and orange colors of the male, and the olive-brown and yellow of the female.

The redstart is of a nervous and pugnacious disposition. During and preceding the mating season the males often pursue one another and fight viciously. A sharp "*tsip*" is often uttered at such times, as well as when the bird is disturbed. The bird, too, is a songster of some ability. Its notes at times suggest those of the yellow warbler, but they are subject to considerable variation so that determination of the species by the song alone is sometimes a precarious undertaking. In my experience a thin wheezing or rasping tone often, although not invariably, characterizes the song of this bird. Chapman (1914, p. 470) writes one version of the song thus: "*Ching, ching, chee; ser-wee, swee, swe-e-e*"; while Eaton (1914, p. 467) gives another common rendition, "*Zee-Zee-Zee*," which he describes as partaking of a sharp rasping quality.

Throughout May, the redstart is an ardent and voluble singer, the immature males, in plumage similar to that of the females, singing as energetically

as the full-plumaged individuals. On several occasions in May, in the Jewell and Sylvan Beach districts, I have observed these yearling males in song; and a few times I have seen what I believed to be female birds in the act of singing. The song continues through June. In early July it becomes less emphatic and fluent and by the middle of the month is heard at much less frequent intervals. While a more or less evident renewal of singing ability characterizes the bird late in July, it gradually wanes, and by early August vocalization is reduced mainly to calls. The bird then becomes shy and remains well under cover in the birch, aspen and alder thickets and amid the foliage of taller trees.

Although the redstart seems to prefer woodland sapling growths among which to breed, deciduous and mixed woodlands are apparently also acceptable to it. In this region I have not observed it much about dwelling houses or villages during the nesting season.

Preceding the nesting season proper is a mating period when the males indulge in a good deal of fighting, and in various strutting antics and other display before the females. My earliest record for the mating act is June 11, 1928. On June 23, 1928, the redstart was common in the woods north of Jewell and a field note under this date reads as follows:

"The males are particularly active and much in evidence now and I believe that the mating time proper is on. They are fighting and strutting and displaying their plumage on every hand. In one of the battles that I witnessed today, two males *hovered* in flight for a few seconds, while they pecked away viciously at each other, then darted into the bushes with tails spread as though their belligerent propensities were not yet satisfied."

The nest of the redstart is commonly placed in the upright fork of a tree or sapling from three to thirty or more feet above the ground. It is a compactly and neatly built basket-like structure, constructed of various materials, but usually containing strips of bark, plant fibers, plant down and grasses, interwoven and lined with rootlets and finer grasses or hairs. The usual complement of eggs is four; they are whitish with delicate spots of lilac, purple or brown sometimes aggregated into blotches at the larger end. Incubation requires twelve days (Burns, 1915, p. 286), and while this duty is performed solely by the female the male assists in the feeding of the young.

I have no early seasonal records for eggs or young birds in this region, but Eaton (1914, p. 468) gives the average date for newly laid eggs as May 28. Aside from the mating habits above noted my earliest date referring to the nesting activities of this warbler in the Oneida Lake region is June 6, 1929, when in a bent-over white birch sapling in the mixed woods just north of Panther Lake, Mrs. Stoner found a partly completed nest. The tree was about four inches in diameter and the nest occupied an upright crotch eight feet from the ground. The redstart is a common bird in the second growth on the rolling woodlands about this lake and evidently it breeds freely here.

Again, on July 17, 1929, I found a nest seven feet from the ground in an ironwood sapling at the north end of Emmons' woods, west of Big Bay. The tree stood near the edge of this isolated woodlot of mixed growth, and about fifteen feet from an open grassy field. The female was on the nest when I

found it. It contained but two eggs, the full complement evidently not yet having been laid.

My earliest record for young is June 28, 1928, when, at the Vandercamp woods where the bird was very common, a female was seen carrying food, presumably for young in the nest. My observations here lead me to think that the time of maximum abundance of young in the nest extends from late June to mid-July.

The following excerpts from my field notes regarding further breeding activities of the redstart during July and August, may be of interest.

"July 5, 1929. Parker woods, one and a half miles southwest of Lakeport. Adult carrying food for young.

"July 8, 1929. Very common in the tall hardwoods on a high ridge extending through the swamp west of Short Point. The trees here are mostly beech, wild cherry, maple, birch, elm and ash. Saw adults feeding young out of the nest. Evidently the bird breeds in this locality.

"July 9, 1926. In an isolated tract of mixed woods a short distance south of Clay, I saw one female carrying food for young. Another female was seen feeding a young cowbird that was out of the nest and able to fly, while an adult female cowbird sat on a limb near by and apparently watched the proceedings. The female cowbird did not offer the young one any food, but after the latter's wants had been satisfied in some measure by the diminutive redstart, she moved close to the young one and at least *appeared* to be solicitous of its welfare. But any maternal solicitude involving real care of the young was utterly foreign to this parasitic bird.

"Today in the woods north of the Oneida River at Oak Orchard the redstart was common and I heard adults giving the warning call to young.

"July 18, 1928. Muskrat Bay district. Found the redstart fairly common today in a tract of hardwoods near the east end of the 'island'—a ridge running through the swamp—on the Ladd farm. Here in a somewhat open place supporting a tangle of wild grape vines and small saplings, I found young not long out of the nest. Both parents were feeding them.

"In an ironwood sapling near by, I found a nest (Fig. 225). It was about eight feet from the ground, and composed largely of thin strips of white bark; along with this were plant down and fibers; some maple leaves also were included, as well as a few strips of bark from wild grape vines. Fine rootlets and pine twigs formed the lining of the nest, the brownish interior being in sharp contrast to the grayish exterior. The whole affair was firmly interwoven and fastened in the crotch of the sapling by white and delicate but very tough and strong plant fibers. These fibers were aggregated in several small patches on the outside of the nest, thus giving a very decorative effect against the grayish background.

"July 18, 1929. Delahunt woods. Young of the year out of the nest a week to ten days.

"July 21, 1928. Common in the woods north of Schroepel's Bridge and Oak Orchard, where it nests in numbers, for I saw several young out of the nest attended by adults and heard others as they were being fed in the bushes.

"July 22, 1929. Several adults feeding young in the woods along Black Creek east of Verona Beach.

"July 26, 1928. Common in the Vandercamp woods one and one-half miles northwest of Cleveland. Saw a male feeding young of the year; other young were observed by both Mrs. Stoner and myself and their food calls were heard all about us. On this [north] side of Oneida Lake I believe the redstart is the commonest species of warbler while on the south side it is exceeded in numbers by the yellow warbler and by the Maryland yellow-throat.

"August 1, 1928. Adults and young of the year common in the aspen growths about two miles west of North Bay village and also in the vicinity of the Fish Creek railroad station."

Detailed studies of the food habits of the redstart have not been made, but that it is highly insectivorous cannot be doubted by anyone who watches the bird, for it is constantly on the alert for flying insects. In the readiness with which it captures them and in certain modifications that aid in the capture of such forms, the redstart bears some resemblance to the true flycatchers. In both, the bill is broad and somewhat flattened at the base and the mouth is surrounded by delicate bristles.

Forbush (1913, pp. 197-198) gives the following account of its food.

"The insect food of the Redstart is perhaps more varied than that of any other common warbler. Apparently there are few forest insects of small size that do not, in some of their forms, fall a prey to this bird. Caterpillars that escape some of the slower birds by spinning down from the branches and hanging by their silken threads are snapped up in mid-air by the Redstart. It takes its prey from trunk, limbs, twigs, leaves, and also from the air, so that there is no escape for the tree insects which it pursues unless they reach the upper air, where the Redstart seldom goes, except in migration. It has been named the flycatcher of the inner tree tops, but it is a flycatcher of the bush tops as well. While there are few small pests of deciduous trees that it does not eat in some form, it is not confined to these trees, but forages more or less among coniferous trees. Also it is seen at times in orchards, and gleanes among shade trees in localities where the woods are cut away."

Beetles, caterpillars, moths, true bugs, mayflies, two-winged flies, hymenopterans and spiders are said to make up the bulk of its diet.

At the Parker woods on July 3, 1929, I saw a male redstart in the act of feeding on a large brownish looper larva which it pounded vigorously on a limb in an attempt to subdue it; after considerable effort on the part of the bird, the mangled larva was swallowed entire.

Even though it is of small size, a bird that partakes almost exclusively of an insect diet, and that is as abundant as the redstart in the Oneida Lake region, must be of some service in helping to hold in check many kinds of troublesome and noxious forest and other insects.

Adult male: Upper parts black; basal portion of all the wing feathers and basal portion of all the tail feathers except the central pair, orange. Chin, throat and most of breast black; sides of breast, flanks and lining of wings orange-red; belly white, tinged with salmon. Adult female and male of the first year:

Grayish olive-brown where the male is black on the upper parts and yellow where the male is orange. Head gray.

WEAVER FINCHES: FAMILY PLOCEIDAE

English Sparrow. *Passer domesticus domesticus* (Linnaeus).

Since its introduction into the United States at Brooklyn, New York, in 1851, the English sparrow has spread to nearly every part of the country. In most of the Oneida Lake territory it is a very common resident. It is, of course, much less common in the sparsely inhabited wooded section north of the lake than in the agricultural districts immediately surrounding that body of water and which extend to the east, west and south. Even in the outlying wooded districts, which many years ago were invaded by the lumbermen, but which for a long time have been sparsely inhabited by humans, this hardy bird is likely to be found. The domestic habits of the bird are reflected in its chief abundance in and about the towns, villages and farmyards.

The habits of the English sparrow are so well known that an extended account is unnecessary, but some comments and observations relative to its status locally may be of interest.

The gregarious tendencies of this bird are exhibited throughout the season not only in its nesting but in its feeding activities. The flocks may be large or small, but a given group seems to occupy and range over a rather limited amount of territory. For example, on the larger farms in such places as the Lakeport, Bridgeport, State Bridge and Oneida Valley districts, the birds occupying a given set of farm buildings apparently keep well within the immediate vicinity, and a group occupying the premises at a cow barn in the West Monroe district keep well to that territory. It seems that these birds do not wander so far from a selected home site as do most of our native birds.

It is evident that the wide open fields, the larger and more inviting farmyards and the larger numbers of live stock, that is, the greater supply of the preferred food and shelter, are the factors responsible for the abundance of the English sparrow throughout the territory to the south and east of Lakeport, where it is present in greater numbers than I have observed elsewhere in the region.

It has been my experience that the bird is least common locally in the territory to the north and northwest of North Bay village. However, this sparrow follows closely on the heels of settlements, and in such isolated communities as those at Panther Lake, the Soule cottages at Vandercamp and the little group of farm buildings at the Louis Will Game Retreat near Kibby Lake it is present in numbers.

The gregarious habits of the bird also are exhibited in late summer when it visits the fields of ripening oats, buckwheat and other grain; and I have no doubt that it exacts a considerable toll from the farmer through these concerted depredations. It is at this season, too, that the species is at its maximum of abundance, for three or four broods have been reared during the summer, not many of the birds of the year have met death through accident or otherwise, and usually weather conditions have been favorable, so that most of the young have come through successfully. Oats and buckwheat are the principal small grains raised in this territory, and between the red-winged blackbirds, the bobolinks and the

English sparrows an aggregate loss of no mean proportions may result. During late July and all through August these flocks are most noticeable. Even after the oats are cut and in the shock it is visited by multitudes of English sparrows that feed upon it. It is not unusual to see ten or fifteen birds thus engaged on a single shock.

In late July, too, I have seen the birds here feed freely upon the seeds of standing timothy. On one occasion I watched for some time a bird as it clung to a woven wire fence and pecked at the heads of the plants as they were wafted toward it in the breeze. During haying time the birds frequent the freshly cut hay in numbers and I suspect that not only grass and weed seeds but a goodly number of insects are then eaten by them.

In the late summer and early fall a great mortality among the English sparrows occurs locally, due to speeding motor cars, especially on the highway encircling Oneida Lake. Both young and old visit the paved highways in numbers to feed on waste grain, insects or other food they find on or beside the road. The mortality from this cause is greatest among young birds able to fly well, but presumably unable to judge the speed of approaching cars.

That at least the local distribution of the English sparrow is affected to some degree by the ever-increasing numbers of the European starling seems apparent not only from my own observations but also from the statements of others. Mr. William Parker, a farmer living south of Lakeport, tells me that the English sparrow is not so common now as it was a few years before the starling appeared here, having in many places been driven out by this larger species. It has been my observation also that if starlings are common about a certain farmhouse few or no English sparrows will be found there; and, conversely, the English sparrow is commonest about those farmyards where the starling is absent.

Mass roosting of the English sparrow is not so common in the comparatively thinly populated country districts about Oneida Lake or in the towns and villages, so that in this respect it does not make itself the nuisance that it is in many cities where colonies of considerable size roost in the vines and other sheltered places about buildings.

The bulky, unsightly nests of dried grass, twigs, straw, feathers and other miscellany are built in a great variety of situations. As a nesting site the birds frequently appropriate the boxes that have been erected for other birds and thus again bring themselves into popular disfavor. In this territory the purple martin, tree swallow, bluebird and house wren are the native birds, the nesting activities of which are most disturbed by these pugnacious sparrows. At one residence in the Lower South Bay district a pair of English sparrows occupied a nesting box that had been intended for purple martins. A family of robins had been reared in it in May and in early July the pair of sparrows took possession of the box and reared a brood in it. (Fig. 198, bird house on tall pole.) In the same locality on August 9, 1929, a pair of English sparrows had preempted a martin house and were then building a nest in it. A brood of young martins had been reared in this house earlier in the season.

The eggs vary in number from four to seven, and at least three (probably in some cases four) broods are reared in a season. Among the bird inhabitants

of the territory the English sparrow, robin and the starling are the most persistent rearers of young.

In an economic way the English sparrow is generally considered a pest, the counts against it being its pugnacious disposition, its attacks on native wild birds and the usurpation of houses erected for the convenience of more desirable birds, its destruction of grain, fruit and garden products, its defacement of buildings, trees, shrubs and vines and its harsh, clamorous and almost incessant call. In addition, according to Ewing (1911, p. 340), this sparrow not infrequently harbors and is responsible for the dissemination of the chicken louse or chicken mite (*Dermanyssus gallinae* Redi) and of another mite (*D. avium* De Geer) which is also an external parasite on our native song birds as well as on cage birds.

On the credit side of the column, which it must be admitted is far outweighed by the above list of undesirable qualities, is the undeniable fact that the English sparrow feeds upon weed seeds and that it takes at least some noxious insects, particularly during the breeding periods. At the same time it has been found, through stomach examinations made by the U. S. Biological Survey, that many beneficial and neutral insects also are taken.

So generally has the English sparrow come to be recognized as, on the whole, an undesirable citizen that measures for its destruction have been taken, which are recommended under certain conditions. Ways and means to the end are set forth in Farmers' Bulletin 493 of the United States Department of Agriculture, and in the more recently issued United States Department of Agriculture Leaflet 61 which has superseded the earlier paper.

MEADOWLARKS, BLACKBIRDS, ORIOLES, ETC.: FAMILY ICTERIDAE

Bobolink. *Dolichonyx oryzivorus* (Linnaeus).

Throughout the low-lying meadows and open grassy fields, particularly characteristic of the territory immediately to the south of Oneida Lake, the bobolink is a common summer resident. On the north side of the lake continuous areas of open grass land are of more limited extent, yet even here, too, the species occurs in numbers so that it is well distributed throughout the territory.

My earliest spring record for the bobolink is May 2, 1929, when a few males were observed in the grassy meadows bordering the Cicero Swamp south of Clay. I suspect that spring arrivals may be regularly looked for late in April. Sadler (1926, p. 12) gives April 26, 1913, as the earliest date seen and comments as follows on the record: "There was an unusually warm wave for several days and on the 26th the temperature was 84° F. which doubtless explains this early arrival. The male bird was seen between Brewerton and South [Lower] Bay and he was singing."

The early spring arrivals are all males, and my observations indicate that it is not until after May 15 that females are to be seen here, although the number of males is continuously augmented by new arrivals. I believe that the migratory movement does not cease until about May 22, for suitable localities throughout the territory seem to increase continuously in population up to that time. My field notes of both seasons bear out this statement. A field note un-

der date of May 24 gives some notion of the status of the bird at this season: "The bobolink is now more abundant in the Bushnell Point district, than at any other place I have yet visited, although it is found in considerable numbers in marshy meadows all along the south side of the lake, and also on the north side."

On the south side of the lake the grassy meadows are larger, more open, and support a more luxuriant growth in general than on the north side. Other localities where the bird is especially abundant, and nests, include the Lower South Bay, Fish Creek Landing, Bernhard Bay, Maple Bay, Bridgeport, Muskrat Bay and Shackelton Point districts. A narrow strip of open country along the north shore of the lake offers many favorable habitats of smaller size, such as are to be found in the F. C. Soule estate northwest of Cleveland. Likewise many parts of the "back country" meadows, though often closely surrounded by woodland, support a few of these rollicking songsters. In fact, the territory all along the highway encircling the lake offers a multitude of nesting and feeding places.

The principal southward movement toward the winter home in South America begins in late August and continues throughout the month of September.

The far-famed ability of the bobolink as a songster has not been exaggerated. Its sociable habits often result in bringing together several males for what might appear a vocal contest. "There certainly is something very entertaining in the abandonment, ecstasy and irrepressible merriment of the Bobolink's melody as he sits in the blossoming apple tree or swaying on a tall spear of grass pouring forth his soul to his mate hidden in the meadow, or to the soul of summer. Frequently he is too much overcome with his feelings to remain in the apple tree and soars about over the meadows with quivering wings and gurgling roundelay. If his mate chances to appear he gives chase and pursues until she darts among the thick grasses to resume her duties of house-keeping." (Eaton, 1914, p. 223.)

In addition to its song the bobolink has a call note sometimes described as a sharp, metallic "*chink*."

While I have any amount of evidence that the bobolink nests in the territory I was never able to find an occupied nest, although I have spent hours in the search. The nests are well hidden, and the female if flushed usually runs some distance through the grass before taking wing so that its detection is often rendered difficult.

The nest is constructed of dry grass, leaves and weeds and is placed in a depression in the ground in a low grassy field. Ordinarily five or six eggs make up a clutch; they are grayish white, irregularly blotched and marked with brown and purple.

In the Cleveland district I observed the bobolink mating on May 23. Sadler (1926, p. 12) records a nest with five young birds on June 23, 1914, and my earliest date of circumstantial evidence regarding young is June 26, 1928, when I saw a female carrying food in the Fish Creek Landing district. On June 21, 1929, I saw a female collecting dried grass stalks from the side of a graveled road near Cicero Center, and carrying them to an adjoining open meadow. Again,

on June 24, I saw a female carrying food for young in a clover field three miles southeast of Bridgeport. On July 5, 1929, the first young out of the nest were observed in a clover field about two miles south of Lakeport. The adults were much excited over my intrusion. On July 12, 1929, in a low-lying, grassy field south of Delmarter Bay, young out of the nest and attended by adults were common. In the Bernhard Bay district on July 27, 1929, young which had been out of the nest three to four days were observed. From July 10, young of the year are common in suitable localities all through the region. Toward mid-August birds of the year as well as adults frequently congregate in numbers in some favored spot to pass the night. The Cicero Swamp south of Clay is a favorite retreat of the bobolink at this season.

Reduction in singing is apparent as early as the first week in July, and from then on vocal ability diminishes markedly.

Among the more conspicuous songsters of the territory my observation has been that song ceases earlier in the bobolink, Canada warbler and oven-bird than in the red-eyed vireo and the song sparrow.

With the cessation of song, the bobolink becomes more retiring in habits and from mid-July through the first week in August it is seldom to be seen. Indeed, the *apparent* absence of the bird in districts where a few days before it was very common is rather striking. On July 16, 1928, when a field trip was taken from Lower South Bay to Brewerton, Coble Point, Phillips Corners, West Monroe Cemetery and return, not a bobolink was seen or heard during the entire day. On other field excursions at this period similar conditions were experienced. On July 17, 1928, on an all-day field trip not a bobolink was seen or heard until at 4:30 P.M., in an open field near the Cicero Swamp, a flock of about twenty males and forty females and young of the year was found. The males were silent and the unobtrusiveness and quietness of the species seemed rather singular.

It is at this season, too, that the complete postnuptial molt takes place, when most of the energies of the bird are absorbed in the production of a new feather covering rather than in vocalization and breeding efforts. Sadler (*loc. cit.*) records males in the transition plumage as early as July 20. By August 7, many of the males are in the "reed bird" plumage, but birds in intermediate stages of molt are very frequently seen at this season.

On August 13, 1928, I saw one male in "reed bird" plumage and another in the process of molting the breeding plumage. While the body plumage was entirely black, the only white that showed was a little on the wings and rump; the yellowish white patch at the back of the head had been entirely lost. Apparently this is one of the first feather tracts to be lost at this molt.

By August 10, singing efforts are considerably curtailed, most of the males are in the reed bird plumage and flocking is very apparent. At this time the bobolinks, along with the red-winged blackbirds, visit the oats fields in numbers and feed on the seeds of the standing grain.

Toward mid-August a partial resumption of song may occur. At this season I have heard males that have completely lost the nuptial plumage

singing a low, pleasing melody similar to that given earlier in the season, but considerably less vigorous.

While the bobolink is in New York State its food habits are all that could be desired, for it feeds almost entirely on insects. However, in their southward movement the birds invade the rice fields of the Carolinas, Georgia and Louisiana and within the period of a few weeks cause an enormous loss to the planters. Its fondness for rice is responsible for the colloquial name "rice bird". By way of compensating for some of the damage that the bobolink does to the rice fields in early autumn, I may say that during the last half of April and the early part of May multitudes of north-bound birds stop over in the vast celery districts of Florida and there feed upon various species of celery insect pests, one of the most formidable of which is the celery leaf-tier. These birds serve as one of the important checks on the abundance of that noxious insect.

In breeding plumage the male bobolink is largely black; scapulars, rump and upper tail coverts white; back of head and neck buffy. The female has the upper parts olive-buff streaked with blackish while the under parts are yellowish white. The winter plumage of *both* sexes is similar to but a little darker than that of the female in summer, and is acquired by a complete post-nuptial molt, a phenomenon of uncommon occurrence among passerine birds.

Eastern Meadowlark. *Sturnella magna magna* (Linnaeus).

An abundance of suitable habitat for the meadowlark, such as open grassy meadows and pasture lands, is found all about the south side of Oneida Lake and to a more limited extent on the north side. The species begins to arrive early in March, and occasionally late in February. Sometimes a few individuals may remain all winter if suitable feeding grounds are available, but it is habitually a migratory species and most if not all the birds of this region depart during the month of November.

Among the open-field birds of the region, the meadowlark is a common species, being exceeded in numbers only by the Savannah sparrow and bobolink, with the vesper sparrow occupying fourth place. It does not frequent the marshes, but is often found on the grassy slopes bordering them. Neither is it an inhabitant of the wooded districts although it feeds and nests in meadows closely bordered by woodlands in such situations as occur in the Panther Lake and Shaw Point districts. To set forth the places where this bird occurs commonly in the region would mean simply an enumeration of all the open grassy tracts that are not closely or at all pastured; these are of greater extent in the Lakeport, Bridgeport, Lower South Bay and Fish Creek districts than elsewhere. The more or less wooded and hilly districts north of Constantia and Cleveland attract relatively small numbers of meadowlarks. On the north side of the lake the West Monroe district is probably the area of greatest concentration.

The characteristic alternate flapping and sailing flight, during which the outer white tail-feathers show conspicuously, carries the bird forward swiftly and directly.

In addition to the well known clear liquid whistle which has been translated "*laze-kill-dee*" or "*spring-most-here*," the meadowlark utters when excited a low "*yert*" followed by a twitter and accompanied by a flirt of the tail. It frequently perches on top of a fence post or a low tree to sing, but I have often seen it walking blithely along through a meadow, stopping at intervals to unburden itself in song.

The nest of the meadowlark is another for which I have spent hours in searching. It is usually well hidden in the grass or beside a hummock. It is built of weed stems and coarse grasses and lined with finer grass. Its arched construction adds to the difficulty of finding it. Five or six white eggs spotted with reddish brown make up the usual clutch. Although I did not find the nest, I saw an adult carrying food for the young on May 25, 1929, in a grassy field near Emmons' woods on the west side of the Big Bay district. This is my earliest breeding record. Adults carrying food for young were observed at several points in the region throughout the month of June.

On June 3, 1929, in an open grassy field half a mile northwest of Bernhard Bay, we found a nest well toward completion. This nest was composed of dried grass worked into a slight concavity of the soil and was partly hidden by a tuft of grass; a sort of runway under the overhanging blades of grass led to it.

On June 17, 1929, in a grassy field about one and a half miles northeast of Brewerton, I banded a young meadowlark that was able to fly a little and had apparently left the nest that morning. It was attended by the parents, and I believe that other young from the nest were hiding in the grass near by. The adults employed the well known broken-wing ruse in an attempt to distract me as I held the squeaking young one in my hands.

In the Cleveland and North Bay districts on July 24, 1929, I found young that had been out of the nest about a week.

The meadowlark is not a highly arboreal bird and most of its subsistence is taken from the ground. More than 75% of its food consists of animal matter of which insects make up the larger part. Grasshoppers and crickets form a considerable share of these; other large items are caterpillars, bugs and beetles. Of the latter a certain number are beneficial predacious forms. Weed seeds and waste grain make up the bulk of the vegetable material; and a certain amount of fruit, mostly of the wild variety, is taken. While some complaints among farmers in other sections of the country are heard regarding the habit of the meadowlark of pulling up newly planted corn, I have heard of no such complaints in the Oneida Lake region.

The brown upper parts heavily streaked with blackish, the bright yellow under parts with a large black crescent on the breast and the white outer tail-feathers will serve readily to distinguish this generally familiar bird.

Eastern Red-wing. *Agelaius phoeniceus phoeniceus* (Linnaeus).

Owing to the considerable amount of low-lying marshy land in the Oneida Lake region, breeding and feeding places such as the red-winged blackbird chooses are numerous throughout its extent. As a consequence, this species is one of the most abundant if not the most abundant local summer resident in this territory.

Not only during the spring and fall migration but also throughout the summer, this bird is much in evidence. It arrives from the South in small flocks late in February, and through most of March incoming flocks augment the numbers already present, so that by May 1 mating is well under way and the red-wing already has become the dominant species of bird in the region. It leaves for its winter quarters in the southeastern states during the month of November. Occasionally a straggler remains in the territory all winter.

Certain areas in the territory seem to serve as concentration centers for the red-wing when it arrives in the spring, as well as after the migratory movement has ceased. The low willow-clad margins of the lake in the Short Point, Shaw Point, Maple Bay, Lower South Bay, South Bay, North Bay and Bernhard Bay districts afford particularly favorable habitats, while the clumps of willows in the low flats on the west side of Chittenango Creek at Hitchcock Point, the Lower South Bay district and in fact well around the south side of Oneida Lake, afford numerous highly satisfactory breeding places. On the north side of the lake the distribution of the bird is confined largely to the low, swampy, willow-clad territory immediately adjacent to the water and to the outlying marshy swales. The Fish Creek district, too, is a favorite haunt of the red-wing. On May 25, 1928, I found the species very common on Frenchman Island and evidently preparing to nest.

The red-wing is an alert, strong-bodied bird, active in the air, with a belligerent, pugnacious disposition toward other birds. These proclivities are particularly evident during the breeding season, when I have often observed it pursuing hawks, crows, great blue herons, bitterns and even starlings and other birds for a much greater distance than seemed necessary in order to safeguard its own domain. On June 19, at a marsh near Toad Harbor, I saw an American bittern so closely pursued and harassed by a male red-wing that it evidently was forced to take refuge in some tall dense grass and weeds. I have also seen a red-wing chase a killdeer and have all the better of the argument. Nor does it draw the line on such excellent flyers as barn swallows and tree swallows which also congregate in numbers in the swamps to roost. Expert in flight as the latter are, they have a difficult time in escaping the angry pecks of the red-wings which can twist and turn and side-slip and glide almost as well as the swallows. Sometimes two or more red-wings unite in pursuit of a common enemy.

The well-known "*kong-quar-rééé*" of the red-wing is often sung by hundreds of birds together, especially in the spring and early summer. About the middle of July the song ceases, but seems to be renewed later in



Fig. 226. Willow swamp, Big Bay district. Breeding place of eastern red-winged blackbird. June 8, 1928.



Fig. 227. Willow swamp in South Bay district. Habitat of eastern red-winged blackbird, American bittern and Wilson's snipe. May 16, 1928.



Fig. 228. Nest of eastern red-winged blackbird in willow swamp one mile south of village of Sylvan Beach. May 16, 1928.



Fig. 229. Nest of eastern red-winged blackbird in grassy marsh about two miles west of village of West Monroe. Nest contains two eggs and two very small young. May 29, 1928.



Fig. 230. Young eastern red-winged blackbirds from nest in grassy marsh one mile west of village of West Monroe. June 8, 1928.

the season before the southward migratory movement sets in. A frequent call note is a harsh "*chuck*" accompanied by a flirt of the tail; the alarm note "*chee -e -e -e -e*" is often given when the nesting place is disturbed, and while the birds fly about excitedly, giving vent to their irritation.

Toward evening, after mid-July, great flocks of red-wings repair to the various outlying swamps such as the Cicero Swamp, the Big Bay Swamp and others, there to settle down for the night among the rushes and other vegetation (Figs. 226 and 227). Sometimes these birds are accompanied by bronzed grackles and starlings. In early morning they disperse to their feeding grounds, to reassemble at dusk. Flocks composed of two hundred to five hundred or more birds are not infrequent, and their concerted aerial acrobatics, particularly in the evening just before settling themselves for the night, are always a cause for wonder.

While the red-winged blackbird nests in a variety of swampy and marshy places it prefers the low sedges, cat-tails and willows growing in the shallow water at the edges of the lake, in the adjoining swamps or in outlying ponds and streams of the region (Figs. 228 and 229). Low, open, grassy fields seem to be a second choice. We have also found nests in roadside alder bushes on high ground some distance from water.

The compact, strongly built nests are usually constructed of grass and sedges so intertwined about the supporting structure that they are difficult to dislodge (Fig. 228). A lining of fine grass and rushes is usually provided. I have found nests on the ground, partly hidden by a grassy tussock and in alder and willow bushes from eight to ten feet above the water of marshes and shallow ponds, as well as in all sorts of intermediate situations. However, the type of nesting site most frequently selected is a willow-clad swamp, pond or other body of water. Here the nests are commonly built three or four feet above the shallow water. The usual complement of eggs is four or five; they are pale bluish in color with usually irregular marks of brownish and blackish.

My earliest nesting record is May 22, 1929, when at Shaw Point, in a tuft of marsh grass growing in a grassy swamp, I found a nest containing three eggs. At this season, by far the greater number of birds were preparing to nest rather than actually nesting. However, from this time on through June and the first ten days of July, nests with eggs and young could always be found somewhere in the region (Fig. 230).

The height of the nesting season occurs in June. A field note under date of June 2, 1928, indicates the prevailing conditions at this time: "West side mouth Chittenango Creek. The red-winged blackbird is common on the willow flats here, and nesting in the willows and red-osier dogwoods growing in two or three small ponds near the creek. Found nests with eggs, another with eggs and young just hatched and others with young ready to leave the nest, as well as young already out of the nest. I scarcely expected to find the latter so early in the season." Toward the close of the month young just out of the nest are to be found on all sides. Another field note under date of June 26, 1928, reads as follows: "Fish Creek Landing district. Adults carrying food, but the considerable number of empty nests bears evidence that the greater share of the

young are being attended by their parents in the grass and shrubbery around the marshes."

On June 29, 1928, in the Potter Bay district just west of Cleveland, a considerable colony of red-wings was discovered nesting in the tall grass near the lake, as well as in the low shrubs near by. One of the nests had been built on the ground near the State road, ten yards from it and two hundred yards from the nearest body of water, Oneida Lake. This nest was well concealed in a tuft of grass and contained three young, not yet able to fly, but able to leave the nest, walk about in the surrounding tall grass and return to the nest again, all of which was done while I watched them.

The tops of the extensive growths of shrubby water willow that is found at various places along Fish Creek are also favorite nesting places of this bird.

A smaller second brood is suggested through the observations on a female carrying nesting material on June 25, 1929, and the finding on July 3, 1928, at Hitchcock Point, of a newly constructed nest containing two eggs. At this season practically all the young of the first brood have left the nest. A few days later nests with eggs were found in bushes near the Cicero Swamp. By mid-July all the young birds that I found were able to fly well, although some still were being attended by the parents. Even as late as July 13, I saw a female red-wing carrying mayflies in her bill. And in the Cleveland district on July 26 and 27, females carrying pellets of excrement from the nests, and returning with mayflies and other insects, were noted.

On Frenchman Island, too, the red-wing is the commonest bird, and breeds there. In a visit to the island on July 24, 1928, I found nests in the high-bush blackberry thickets, one young bird just able to fly and scores of older young of the year.

The red-wing makes frequent flights back and forth across Oneida Lake as noted by many direct observations while I was on Long, Wantry and Willard islands. In early August I saw numbers of the birds in the tall grass on Long and Willard islands, feeding on the myriads of mayflies present at that season. On one occasion I saw a few adults, both sexes, together with about forty young of the year feeding on these insects on Long Island.

While some diminution in the numbers of the bird was noted toward mid-August, especially in places where it had been abundant earlier in the season, its continuous presence throughout the summer was obvious, and there was no evidence of an absence or retreat of the birds to some outlying district as has been reported by certain observers.

Owing to the gregarious habits of the red-wing and its tendency to visit corn fields while the grain is in the milk, the species occasionally may be responsible for some damage in this region. However, for most of the period that it is with us it feeds upon beetles, grasshoppers, ants, bugs and flies, as well as lepidopterous, coleopterous and other larvae, to such an extent that its presence must be regarded as beneficial from an economic viewpoint.

On several occasions, especially in May, I have noted this bird feeding from the tops of willows or other low trees in some protected, sunny place

along water, sallying forth after passing insects much after the manner of a flycatcher.

At this season, also, I have noted the birds feeding on the seeds of dried cat-tail spikes. About mid-July this species along with starlings and bronzed grackles begins to congregate in the freshly cut hay fields apparently to feed upon insects. Both old and young are in these flocks, which wander about more or less until the birds leave for the South.

At this season, too, a good many red-wings visit the paved highways, alighting on them to feed upon waste grain and crawling insects.

One unusual occurrence was reported to me by a local farmer who said that red-wings—he was sure that it was this species—had pulled up and destroyed a half-acre of sprouted watermelon seeds on his farm, and that he was compelled to replant on this account.

No doubt some local damage is done both by the red-winged blackbirds and the bobolinks in late summer when they visit in numbers fields of ripening oats. Flocks of twenty to fifty or more birds frequently are seen on areas an acre or less in extent.

The black male with shoulder patches (lesser wing-coverts) bright red margined with buffy, is easily distinguished; but the smaller, dull-colored female, streaked and mottled with dusky and whitish is not so generally recognized.

Baltimore Oriole. *Icterus galbula* (Linnaeus).

The arrival of the Baltimore oriole presages the imminence of summer and few people are unacquainted with this brightly colored, highly arboreal and gifted songster. It is a bird of the villages as well as of the orchards, shade trees and open groves in the vicinity of human habitations, but it is absent from the more densely wooded sections. In the Oneida Lake region it is a fairly common summer resident and may be found wherever suitable conditions occur.

In this region the Baltimore oriole may be expected to arrive from its winter home in southern Mexico and northwestern South America, late in April or early in May, but the peak of abundance is not reached until about May 20, for new arrivals are constantly appearing on the scene. Our earliest record for the 1929 season is May 1, when a single male was noted in tall roadside maple trees in the Lower South Bay district. May 10, was our earliest record for the bird in the preceding season. The males usually precede the females in migration. Females were not seen earlier than May 13. Departure for winter quarters occurs in mid-September.

While this bird is generally prevalent in suitable habitats throughout the summer, the North Bay, Cleveland, Hitchcock Point, Lower South Bay, Sylvan Beach and Fish Creek Landing districts offer particular attractions in an abundance of scattered tall maple, elm and other trees. Frenchman Island, too, is frequented by the bird, which also nests there.

The rich, loud whistle of the Baltimore oriole is a familiar sound throughout the region from early May until about July 5, when a marked cessation in vocalization is apparent. From early July, too, until August 1, the bird is not



Fig. 231. Nest and four eggs of eastern hermit thrush. Widrig woods. June 20, 1929.



Fig. 232. Nest and five eggs of song sparrow in maple sapling. West Monroe district. May 15, 1929.

much in evidence. A field note under date of July 11, 1928, regarding these items may be pertinent here: "Perhaps the cessation of song is as marked in the Baltimore oriole as in any other bird. I have neither seen nor heard an oriole for a week." I did not note a resumption of singing up to August 15; but some observers have noted this phenomenon in the latter part of the month.

The call note is a clear, short whistle, and the alarm note has been described as "A long rattling chatter." (Forbush, 1927, p. 443.) However, I have found that this latter note is exceedingly variable; sometimes it is much like that of the house wren; again it is a rather harsh "*chee-chee-chee*" or "*chee-chee-chee-chee*."

Mating of the Baltimore oriole begins soon after its arrival. In their efforts to gain the favorable attention of the female, the males often indulge in various antics, displaying their plumage and singing with the utmost abandon. Shortly thereafter nest building begins and eggs are likely to be found early in June. My earliest nesting date is May 28, 1928, when a partly completed structure was discovered in a tall elm tree growing on the east bank of Chittenango Creek at Hitchcock Point. At Oakland Beach on May 29, 1929, a female was seen working on a nest about forty feet up in a maple tree fifty feet from the lake. At Fish Creek Landing, June 26, 1928, an incubating bird was noted on a nest in a roadside elm tree. The nest was well hidden among the drooping branches and was not more than twenty feet above a well traveled highway.

Most of the nest building is undertaken by the female. The construction of such a pensile domicile requires no small amount of material and labor. In the outlying districts, such materials as plant fibres, grasses and bark are used, while in the vicinity of human habitations such things as string, yarn, horse-hair, etc., may enter into the structure. Hair, moss or plant down frequently forms the lining. Most of the nests are placed well toward the end of a limb. Several days are required in the building of this complicated structure.

The four to six eggs are white, irregularly marked with lines of brown and black, usually aggregated at the larger end.

My earliest date for young in the nest is June 18, 1929, when Mr. C. J. Warner, near Clay, told me that there was a nest with young in a tall tree near his home. The adults had begun to carry food to the nest three or four days previously. On June 22, 1929, a nest with young was discovered forty feet up on an elm limb overhanging the waters of Chittenango Creek at Hitchcock Point. I watched the activities of this pair of birds for some time and found that the male and the female alternated in brooding and feeding the young. While one brooded the other foraged; when the forager announced its return by a low note the brooding bird yielded its place. This behavior was repeated several times during the period of observation. On one occasion one of the adults carried a pellet of excrement from the nest to a hickory tree twenty-five yards away and dropped it there.

Other nests were recorded in the region during June; and as late as July 8, nests with young were found.

Between July 10 and July 30, young out of the nest but still attended by the parents are particularly common.

After the young have left the nest they are led away by the parents into the woodlands and other more or less secluded places where for a time the parental duties are continued. This is the time of greatest danger to the young birds from their natural enemies.

As the season advances both young and old, along with other species of birds, congregate in the extensive blueberry, huckleberry and pin cherry districts such as the Delahunt woods, the Constantia, Fish Creek, North Bay and other districts where they apparently subsist largely on a vegetable diet.

"Caterpillars are the most important single element of the Oriole's food, forming over a third of the total. The Baltimore is one of the birds that decidedly are not afraid of spiny or hairy caterpillars and it has a good record against such well-known pests as the fall webworm (*Hyphantria textor*), spiny elm caterpillar (*Euwanessa antiopa*), tussock caterpillar (*Hemerocampa leucostigma*), forest tent caterpillar (*Malacosoma disstria*), and larvae of the gipsy moth (*Porthetria dispar*), and browntail moth (*Euproctis chrysorrhea*). . . .

"Beetles, ants, parasitic wasps, bugs, grasshoppers, spiders, and snails are the principal additional components of the Hangnest's animal food." (McAtee, 1926, p. 55.)

On June 7, 1928, near the mouth of Chittenango Creek, I saw two orioles feeding on tent caterpillars (*Malacosoma* sp.) which were common there and elsewhere in the region. One of the birds which I watched more closely picked off a caterpillar from the "tent" and carried it to a nearby limb where it proceeded to peck a hole in its prey and to draw out its body contents, letting the hairy exoskeleton fall to the ground. While in this case the bird avoided swallowing the hairy exterior parts of the larva it no doubt does swallow many of these and similar larvae entire, particularly those in early stages of development.

As already mentioned, blueberries, huckleberries, pin cherries and other wild fruits evidently form a considerable part of the food of this oriole during late summer, and its concentration in such districts is particularly well marked at that season.

Destruction of cherries, peas and cultivated berries by this bird has been reported from other localities at one time or another, but I have heard no complaints about such damage in the Oneida Lake region.

In the male the orange-yellow breast and rump together with the black head, neck, back, wings and tail are distinctive. The female is olive above, distinctly yellow on the rump, and the wings fuscous with two white bars.

Bronzed Grackle. *Quiscalus quiscula aeneus* Ridgway.

Bronzed grackles are abundant in the more open areas of the Oneida Lake region, throughout the summer. The earliest migrants may be looked for early in March, or even late in February, and most of them will have departed for the winter home, Ohio valley to southern Texas, by early November.

The more open conditions on the south side of the lake prove most attractive to this bird which frequents the dooryards, fields and beaches in numbers. All through the season it visits the beaches, apparently feeding upon gastropods, small fish and the like that are washed up by the waves. Evidently the

birds prefer the vicinity of water, for they feed and nest in numbers in such places as the Chittenango Creek district and other like habitats in the region. The open areas immediately around and south of the lake attract them much more than the higher wooded land farther away. Fish Creek Landing, Oakland Beach, Verona Beach, Shaw Point, Hitchcock Point, Muskrat Bay and Big Bay districts are the localities where the grackle is most plentiful throughout the season.

The bronzed grackle is an energetic, aggressive bird and while I have never actually seen it destroying other birds or their nests here, I have seen its pugnacity aroused sufficiently to drive away the starling.

This grackle has a harsh call note or "*clack*," which is uttered during the migratory flight as well as on the more or less local flights from feeding grounds to roosting places. The same note, but louder is uttered when the bird is alarmed. In the spring, a loud, somewhat squeaky and metallic song is uttered to the accompaniment of a good deal of apparent exertion expressed by a fluffing up of the general plumage, a partial extension of the wings and the spreading of the tail feathers.

Early in May, the bronzed grackle begins its nesting activities. On May 3, 1928, I observed a pair in copula, and from May 7, 1928, when a bird was observed carrying nesting material in the Sylvan Beach district, until early July, family cares largely occupy the attention of the adults. During this period nests with eggs and young birds, and adults carrying food for the young are to be noted everywhere in the favorite haunts of the species; these include such places as the thickets along the banks of the Chittenango Creek near its mouth, Short Point, Big Bay Swamp, Shaw Point, Fish Creek Landing, Constantia Bay, Shackelton Point and the Verona Beach districts. Several times I have found nests placed in the branches of willow and other bushes that were only three or four feet above the water.

My earliest nesting date is May 12, 1928, when an incubating bird was discovered in a partly wrecked barn in the Froher Bay district. On May 28, 1928, in the willows along the banks of Chittenango Creek near its mouth, I found nests with very young nestlings as well as one containing young about ready to leave. Usually mating activities continue until about May 20, whereupon nest building and incubation have generally begun.

A field note under date of May 17, 1928, states that: "Nesting is now under way for some; however, the majority are still wandering about, feeding and mating." In the Cleveland district as late as July 19, 1929, I saw adults carrying food to young. This suggests the likelihood of a second brood.

The bulky nest is composed usually of twigs, weed stalks and dried grass, with an inner cup or layer of softer material. It may be placed in a great variety of situations such as the branches of willows hanging low above the waters of a pond or stream, the higher branches of tall dooryard trees or, as above noted, in an abandoned out-building. In this region the bird seems to prefer the outlying swampy districts rather than the vicinity

of human habitations for a nesting site. The bluish green eggs usually number five.

The young leave the nest amid great excitement and noisy display on the part of the adults.

After the breeding season both old and young gather in great flocks to feed in open fields and along the beaches, roosting in the adjoining swampy districts. Often they are accompanied by cowbirds and red-winged blackbirds.

This tendency to flock is first noted early in July and continues throughout the summer, the groups apparently being augmented almost daily by new arrivals until some of the flocks contain several hundred birds. In the evening from favorable sections of the Big Bay, Cicero and other swamps a perfect bedlam of voices rends the cold, damp air as the birds congregate preparatory to settling down for the night. From about July 15, as dusk comes on, great numbers of the birds are to be seen coming in to these concentration points from all directions. Their flight is then direct and rapid towards their objective.

At this season, too, the mortality among bronzed grackles, of all ages, from speeding motor cars on the paved highways about the lake is considerable, and much greater than at any other time.

The open meadows and cut-over hay fields on the south side of the lake, as well as those along the north shore in the vicinity of Cleveland, are favorite feeding resorts of these birds on warm sunny days in mid-July. At this time also they are noisy and excitable. Adult birds are observed frequently at this period with one or several of the wing-feathers lacking, indicating that the molting season has arrived. Other local districts which appear to be particularly attractive to the bird as feeding grounds include the Muskrat Bay, Bernhard Bay, McClanathan woods, Lower South Bay and Fish Creek Landing districts as well as the swampy woodland in the Short Point district. Frenchman Island, too, is a favorite feeding and nesting place.

From an economic viewpoint the bronzed grackle or crow blackbird has an evil reputation among the agriculturists of the region, and not without some cause for tales of its misdeeds in pulling up sprouting corn reached me from many sources. One report stated that this bird had destroyed two acres of sprouting sweet corn in the West Monroe district; another credited the bronzed grackle with greater destructiveness than the crow in the matter of pulling up sprouting corn. This belief is held generally among the farmers of the region. Other reports stated that the grackle feeds extensively on newly sown buckwheat. Mr. G. E. Moore said that he lost an entire field in this manner.

On May 29, 1928, in an open area in the Nicholson Point district, I found several birds of this species in a dying condition. Upon examination of the alimentary canal of the specimens, I found both the crop and the stomach full of corn that apparently had been poisoned at the time of planting. My discussions with the farmers in the district developed that it is a common practice among some of them to poison the grain before planting.

However, destruction of birds by the poison method is a thing to be avoided, and it would be better to treat the corn with a suitable deterrent. Later in the summer some slight loss may be incurred from the visits of these birds to cherry orchards, berry patches and gardens, but my observation in the present territory has been that damage from this source is very limited.

While there can be no doubt that the bronzed grackle causes a certain amount of damage to cultivated crops, cognizance must be taken of the hosts of destructive insects, such as beetles and grasshoppers together with lepidopterans and miscellaneous insect larvae that form a goodly share of its diet. While the black mark against this blackbird is accentuated by its undoubted frequent destruction of some of our smaller native birds, it has, however, certain redeeming qualities by reason of other and beneficial food habits, pleasing appearance and buoyant bearing which, to my mind, considerably mitigate the evil that he does.

Male with head, neck and upper breast deep purplish or steel-blue; wings and tail purplish with metallic reflections; the general plumage black with a bronzy sheen, and the feathers of the back without iridescent bars; iris light yellow. Female similar, but smaller and duller.

Eastern Cowbird. *Molothrus ater ater* (Boddaert).

The cowbird, so called on account of its habit of following cattle, is a moderately common summer resident in the region where it arrives in late March and early April. Occasionally a few may remain all winter, but the main southward movement occurs during the first half of November.

This hardy, weak-voiced, parasitic member of the family occurs alike in woodland, swamp, thickets, clearings and pastures, but seems to prefer the more open or semi-wooded conditions. While it occurs for the most part in the last named situations it invades also the more heavily forested sections in the Constantia, Cleveland, Verona Beach and other districts, to lay its eggs in the nests of small forest-loving birds. However, the open conditions in such districts as Lower South Bay, Bridgeport, Lakeport and West Monroe are more generally favored and there, particularly after the breeding season, the cowbird occurs most commonly. Especially do the small isolated wooded tracts, so frequent to the south of the lake, appeal to the cowbird, for here it finds such species as the song sparrow, yellow warbler, red-eyed vireo and redstart—birds that it habitually parasitizes—nesting in numbers.

During spring and late summer cowbirds frequently associate with the flocks of red-winged blackbirds and bronzed grackles that form such a conspicuous part of the open-field bird life in the territory. From late June on through the summer, groups of cowbirds, sometimes accompanied by starlings, are frequently seen feeding about herds of cattle. In late July and August, they join the throngs of red-wings and grackles that repair nightly to the Big Bay, Cicero and other swamps to roost.

Promiscuous mating occurs late in April and early in May, at which time in or along the edges of woodlands a female or two may be seen surrounded by several attentive, attitudinizing males making vigorous though largely fruitless attempts at song. A low, liquid, guttural "*chuck*" or chortle is the net result. At this season I have frequently come upon small groups of these birds in the Van Antwerp, Emmons, West Monroe Cemetery and other isolated wooded tracts in the region. At times, too, small groups of males and females strut about the open fields, feeding, preening their plumage and apparently enjoying life. The birds have a sly, sneaking, stealthy movement that is particularly marked as they wander about through the sparsely wooded districts, seeking a victim.

While more than one hundred species of song and insectivorous birds have been listed as foster parents of the cowbird—Friedman (1929, pp. 198-201) lists one hundred fourteen species—we have found it parasitizing eight species in this territory. Undoubtedly others should be added to the local list, for Eaton (1914, p. 227) says that he has noticed "at least thirty-five species parasitized by this bird."

The eggs of the cowbird are white, more or less uniformly speckled with brownish. Although I never found more than two cowbird eggs in the nest of another bird, Eaton (*loc. cit.*) states that frequently as many as three or four are found in one nest, in which case "only one or two or possibly none of the eggs of the nest owner are found with the Cowbird's eggs." Apparently but a single egg is usually deposited in a given nest, although Friedman also (*loc. cit.*, pp. 181-186) mentions several nests containing four eggs and reports several females having deposited five eggs, though not all were laid in one nest.

Sometimes the rightful owner of the nest throws out or destroys the intruder's egg or, as in the case of the yellow warbler noted below on June 9, 1928, builds a floor over the cowbird's egg so that it will not be incubated; then lays a fresh clutch of its own. That the nesting bird recognizes the strange egg in the nest can not be doubted.

The incubation period of the cowbird's egg is said to be ten days (Burns, 1915, p. 285). Owing to the fact that the cowbird's egg is usually larger than that of the nest-builder and consequently receives the greater amount of body heat from the incubating bird, it hatches before the eggs of the foster parent who is then obliged, through maternal instinct, to leave the nest at intervals to attend the wants of the young bird. During these periods of absence the eggs cool somewhat so that the time of hatching is delayed, and by the time they have hatched the young cowbird has attained some size and strength. Being larger, it obtains more food than the young of the foster parents and the usual result is that in its nest struggles and exercises it sooner or later pushes out the other young birds which eventually die from exposure or starvation. Strangely enough, the foster parents always seem to be as solicitous of young cowbirds reared by them as they are of their own offspring. The yellow warbler, red-eyed vireo and song sparrow appear to be the birds most frequently imposed

upon in this region, but I suspect that this is due to their comparative abundance rather than to any selective qualities displayed by the cowbird.

The appended table gives in brief form our findings relating to the parasitic habits of the cowbird in the Oneida Lake region.

TABLE NO. 26.—SHOWING PARASITIC ACTIVITIES OF THE COWBIRD
IN THE ONEIDA LAKE REGION.

Date	Locality	Status of Cowbird	Foster Parent
June 9, 1928	Lower South Bay, Pattat residence	Egg	Eastern yellow warbler
June 25, 1928	Cleveland district, F. C. Soule estate	Young out of nest	Attended by pair of oven-birds
June 27, 1929	Oak Orchard district	Egg	Veery's nest; also three veery eggs
July 8, 1929	Short Point district	Young out of nest	Attended by adult eastern robin
July 9, 1928	Clay district. Isolated hardwoods south of village	Young out of nest; able to fly	Attended by female redstart
July 12, 1929	Shackelton Point district	Young out of nest; able to fly a little	Attended by pair of song sparrows
July 15, 1929	Verona Beach district; woods one mile east	Young out of nest; able to fly	Attended by pair of eastern wood pewees
July 16, 1928	Nicholson Point	Young out of nest	Attended by eastern yellow warbler
July 21, 1928	Lower South Bay district	Young able to fly	Attended by a pair of eastern yellow warblers
July 21, 1928	Lower South Bay district. Barberry bush, Pattat residence	Nestling	In nest with three young song sparrows
July 28, 1928	Village of Cleveland; cottonwood tree on lawn	Juvenile; able to fly	Attended by a yellow warbler
August 1, 1928	Fish Creek Landing	Young of year; able to fly	Attended by a red-eyed vireo

In the case of the above tabulated cowbird attended July 9 by a female redstart, one feeding occurred while the young cowbird and an adult female cowbird were sitting close together on the limb of a small hemlock. The female cowbird offered the young one no food or attention, apparently leaving those duties to the smaller redstart.

A large share (60%) of the cowbird's food consists of weed seeds while other vegetable food, chiefly waste grain, makes up about 18% of its diet. Animal matter, mainly grasshoppers and other insects, constitutes approximately

22% of its food (McAtee, 1926, p. 54). One cowbird nestling will require scarcely as much insect food to bring it to maturity as would the usual family of yellow warblers, red-eyed vireos or song sparrows, and since insects make up such a comparatively small percentage of the food of the adult cowbird it can lay no strong claims to consideration on economic grounds.

The general glossy black upper parts and "coffee-brown" head, neck and breast at once distinguish the male, while the female is uniformly brownish gray, faintly streaked with black; lighter on the throat.

TANAGERS: FAMILY THRAUPIDAE.

Scarlet Tanager. *Piranga erythromelas* Vieillot.

This species is a common summer resident in the forests and larger groves throughout the Oneida Lake region. The male is the most strikingly colored of any of our summer birds. Its uniformly bright scarlet plumage with black wings and tail is familiar to almost every one, but the somber-colored, olive-green female with dusky wings is much less commonly seen and known. In the popular mind it is often considered to be another kind of bird.

The scarlet tanager was seen in almost every sizable tract of deciduous and mixed woodland on the north side of Oneida Lake, and in many of those on the south side. However, I found the bird most common in the Cleveland, Jewell, Constantia, Sylvan Beach, Panther Lake and Oak Orchard districts. The Vandercamp and other woods just north of Cleveland are particularly favorable territory. Other wooded tracts that appeal to it are the Steding woods two miles south of the village of Oneida Lake, the William Parker woods one and a half miles southwest of Lakeport, the Emmons woods west of Big Bay and the locality at the mouth of Chittenango Creek. And during the summer one can always find a pair or two at the cemetery on the high wooded lake shore just east of Cleveland and in the Sauers woods just south of the West Monroe Cemetery.

While my earliest spring record for the species in the Oneida Lake region is May 16, 1929, the first arrivals undoubtedly appear about ten days earlier. Ordinarily the males arrive several days in advance of the females. The last birds are likely to leave early in October. The species is most in evidence throughout June and July.

The scarlet tanager in summer at least is an inhabitant of deciduous and mixed woods such as the tall maple-beech-birch hardwoods north of Jewell and on the F. C. Soule estate, or the birch-maple-hemlock areas north of Bernhard Bay and other villages along the north shore of the lake. The maples and oaks along Oneida River in the Oak Orchard district, too, offer their appeal; and the giant elms and ashes in the low-lying, dense woodland south of Bridgeport and Lakeport claim their share of this species.

During June and the first half of July attention is likely to be first directed to this bird through its song which sounds something like that of both the robin and the rose-breasted grosbeak. It is, however, coarser in tone and a little more rasping or "brassy" than the song of either of these species. Florence Merriam Bailey (Chapman, '14, p. 414) describes it as "a loud, cheery rhythmical

carol." On June 14, 1928, in the tall maple and beech woods bordering a hemlock tract a half-mile north of Jewell I came upon several males, all in full song and within a radius of perhaps two hundred yards of me. Several times I have encountered such groups of singing males. They often select the top of a very high tree, sometimes a dead one, from which to sing. In June when the birds are nesting and in July when young are in the nest or just out of it, the common call note, "*chip, churr*" or, to my ear, "*chip—cough*," is most frequently given as the adults seem to reassure one another or to instill confidence in the young. I have frequently heard this note given as a sort of prefix to the song proper which immediately follows. On July 23, 1929, in the Vandercamp woods, I was particularly struck by an instance of this combination.

The nest of the scarlet tanager is composed of fine twigs and roots, with a finer lining of these materials, and is usually placed toward the tip of a sloping or horizontal limb of a beech, maple or oak, sometimes of a hemlock. I have, however, seen nests of the bird that were at the base of a limb—close to the trunk of the tree. The complement of eggs is three or four. On July 19, 1929, in a fine beech-maple-hemlock woods three miles north of the village of Bernhard Bay, I saw a young bird, evidently out of the nest less than a week, and attended by a male. The young one persistently repeated the food call as it flew and hopped about in the tops of the tall trees. This is a typical nesting place.

Regarding the food habits of this bird, McAtee (1926, p. 67) says: "In its choice of animal food the Scarlet Tanager must be criticized for preying more extensively upon the useful Hymenoptera than upon any other group of insects." Beetles, butterflies, moths, true bugs, caterpillars, ants, white ants, grasshoppers, spiders and snails make up the remaining bulk of its food, so that on an economic basis the beneficial habits of the bird somewhat overshadow the harmful.

FINCHES, SPARROWS, GROSBEAKS, ETC.: FAMILY FRINGILLIDAE

Rose-breasted Grosbeak. *Hedmyeles ludovicianus* (Linnaeus).

While it is generally distributed throughout New York State, the rose-breasted grosbeak exhibits some variation in its status which is, in part, dependent on local conditions. In most places it is a fairly common summer resident, but in the Oneida Lake region its occurrence is less frequent than is ordinarily understood by that designation.

The conspicuous black and white, rose-breasted males arrive the first week in May, some days in advance of the plump, grayish brown females. My earliest record is May 11, 1929.

This grosbeak is generally distributed about the lake where it exhibits a decided preference for dense maple growths rather than for woods of the mixed type, although it does occur in such situations as, *e.g.*, the Vandercamp woods northwest of Cleveland. This is one of the localities in which I have found the rose-breasted grosbeak most common. I have seldom seen it about the villages and it does not seem to frequent the vicinity of farm orchards and groves as much as it does in Iowa. Of course the north side of the lake offers numerous favorable habitats for this pleasing songster, but I have seen it also in

a number of districts on the south side. The following are some additional localities in which I commonly found this bird: Mouth of Chittenango Creek district, wooded tract one-fourth mile southwest of Clay, Short Point district and vicinity of Gordon and Francis ponds and the Panther Lake district; the extensive willow growths near North Bay, Fish Creek Landing and other places, particularly along such streams as Fish Creek, Oneida Creek, Wood Creek and Chittenango Creek.

This species is most in evidence during June, when the males are in full song. It is one of our finest songsters, its "rich, rolling warble," more or less like the song of the robin but of finer quality, is uttered frequently from the top of a tall maple or wild cherry tree. Like the scarlet tanager, this bird often selects a high perch in the sunlight from which to display its plumage to the fullest extent, and where it may abandon itself utterly to the business of singing. During the mating season the rose-breasted grosbeak also has a flight song. Launching itself from the top of a tall tree it speeds away to another not far away, possibly to be joined or pursued *en route* by another male; both are vying with each other for the favor of the female hidden in the foliage nearby, or perhaps one or both pursue the female among the branches. The song is given during the pursuit. I noted this mating flight song at the Vandercamp woods on May 17, 1929, and at other places later in the season. Sometimes several males apparently compete with one another in a singing contest. The tops of four or five tall trees not far from one another will each be occupied by a bird in full song and the effect so far as the human ear is concerned is most pleasing. On May 31, 1929, in a tall maple and black cherry tract about two miles southwest of Gordon Pond, and on June 23, 1928, in the mixed woods north of Jewell I witnessed such performances. After July 1, I have not often heard the rose-breast sing here. Its call note is a loud, sharp, metallic "*pink*."

The rose-breasted grosbeak lays four or five bluish green eggs, spotted with reddish brown, but variable in shades. The nest is placed on the fork of a limb of a maple, beech or hemlock sapling, from five to twenty feet from the ground. On July 26, 1928, I saw at the Vandercamp woods one and a half miles northwest of Cleveland, a female attending young already able to fly.

About October 1, the rose-breasts leave for their Central and South American winter quarters.

"The food of the Rose-breast is derived in almost equal parts from the animal and vegetable kingdoms. Of the vegetable food, wild fruits are the most important item . . ." (McAtee, 1926, p. 65.) Wild cherry, elm, dogwood, elderberry and juneberry are some that it prefers. Beetles, including a good many wood-borers and leaf feeders, comprise the major portion of its animal food. Next in importance are Hymenoptera, caterpillars, scale insects, grasshoppers, true bugs and flies; also spiders and snails.

On at least three important counts—its beauty, pleasing song and economic value—this bird merits the encouragement and protection of everyone.

Indigo Bunting. *Passerina cyanea* (Linnaeus).

Another inhabitant of shrubby thickets and the brush heaps in cut-over areas along the edges of high woodlands is the indigo bunting or indigo bird. While it occupies much the same type of territory as the towhee it is markedly less terrestrial than that bird and is often seen high up in trees and on roadside telephone wires. In the Oneida Lake region it is only a fairly common bird during the summer, but I believe that it is more generally distributed than the towhee. While the indigo bunting is likely to be met with almost any time after May 1, my earliest date for it is May 22, 1929. In the 1928 season I did not see the bird until June 13. The autumnal movement to its Central American winter home begins late in September.

The indigo bird is much commoner in the dry, hilly, wooded territory north of Oneida Lake than in the open flat Lakeport and Bridgeport districts. The dry, brushy hillsides in the Maple Flats district three miles north of Cleveland showed, I believe, the principal local concentration of this species. Here, as elsewhere throughout much of the north-side territory, extensive lumbering was carried on twenty or thirty years ago with the result that among the slashings, growths of aspen, maple and birch saplings have sprung up to form an ideal summer home for this bird. Throughout the hot days of June and July the males were seen and heard consistently as they poured forth their song from some tall dead tree at the edge of the woodland, from an aspen sapling in a brushy hillside tangle or from a roadside telephone wire. Similar conditions prevail in the Constantia Center, Thompson Corners, Elpis and adjoining districts.

Other places in which I have seen this bird in some numbers include the Oak Orchard, Verona Beach, Oakland Beach, Gordon Pond, Jewell, North Bay and Shaw Point districts. It sometimes frequents old orchards and brushy clearings about farm buildings, and I have seen it on the outskirts of Cleveland and other villages about the lake as well as along the margins of the Cicero Swamp south of Bridgeport.

The indigo bunting is a persistent songster. All through the summer the loud, high-pitched warble of the bird is to be heard. In the Vandercamp woods I have heard several males singing at the same time, within a limited area. Even as late as July 28 the birds seemed to have lost little of their ability or inclination to sing. The females seem to be shyer than the males and are often seen skulking in the undergrowth in the vicinity of a singing male.

The nest of the indigo bunting is usually placed two to four feet from the ground in the crotch of a low tree or bush. Dry leaves, plant stalks and strips of bark comprise the bulk of the materials, with a lining of fine grass, rootlets and long hairs. The usual clutch contains four pale bluish white eggs. "The first sets of eggs are usually found between May 25 and June 12, but frequently nests with fresh eggs may be seen as late as July 15 or even the first of August." (Eaton, 1914, p. 332.)

Although I have often looked for nests in the immediate surroundings of singing males I have never been successful. On July 26, 1928, in the

brushy clearings toward the south side of the Vandercamp woods I found young out of the nest. This is a very likely nesting place and the birds frequented this territory in some numbers all summer. In addition, other particularly likely nesting situations are the Constantia Center, Thompson Corners, Elpis and North Bay districts. I have no doubt also that this bird nests sparingly throughout the territory south of Oneida Lake, for we saw occasional birds there throughout the summer.

Detailed studies of the food habits of the indigo bunting are not available, but from what is known of its diet it is largely insectivorous during the time that it is with us. Beetles, grasshoppers, canker-worms, plant lice and cicadas make up a considerable percentage of the animal food. Vegetable food such as buds of trees, weed seed and cultivated grain constitute but a small measure of its food.

Forbes (1882) reports on eighteen indigo buntings shot in an orchard "which had been for some years badly infested by canker-worms." (*Loc. cit.*, p. 2.) The buntings were collected during parts of two seasons. It was found (*loc. cit.*, pp. 12 and 19) that insects composed 97% of the food of these birds, while in the fifteen individuals taken outside the orchard, insects made up 57% of the food. Canker-worms made up 59% of the food of all the birds; only one of the entire thirty-three birds had not fed on this noxious insect. The principal food items were Lepidoptera and Coleoptera while the remainder of the food taken, 3% in one group and 41% in the other, was composed of seeds, chiefly *Setaria*, *Polygonum* and wheat.

Usefulness and beauty are combined in this woodland songster.

Male: Deep blue, darker on the head, brighter on the back; wings and tail black margined with blue. Female: Grayish brown, unstreaked; tail, wings and rump obscurely edged with bluish; under parts whitish, the sides and breast tinged with brownish.

Eastern Evening Grosbeak. *Hesperiphona vespertina vespertina* (Cooper).

It was with some surprise and delight that I first saw this bird of stately bearing but erratic wanderings on the afternoon of May 2, 1928, at Lower South Bay. Two birds feeding on the ground at Dr. Luther's residence here were joined shortly by three others and all flew swiftly away. Three birds were again seen on May 5, 1928, in tall maples near the clubhouse of the Syracuse Yacht and Country Club, a half mile from the place of observation on May 5. On May 10, 1928, I saw two individuals of the same species at the same point. These were the last evening grosbeaks seen in the season of 1928, and none were seen in 1929.

Mr. and Mrs. Eastwood, residents of Lower South Bay, stated that on April 30, 1928, they saw a good-sized flock of evening grosbeaks in the trees on their lawn, during a heavy snowstorm which occurred on that date. They considered the date late for the appearance of this bird here.

These unsuspicious birds attract attention to themselves by their unusual olive-brown coloration with black wings and tail, white-tipped secondaries and large conical, yellowish bill. Various persons about Oneida

Lake have told me of seeing such birds at infrequent and irregular intervals, but were puzzled as to their identity.

The eastern evening grosbeak is a bird of peculiar habits. While it is very irregular in its occurrence in certain areas it is likely to put in its appearance in the Oneida Lake region late in autumn and may remain all winter if food is plentiful. Perhaps a season, or even several seasons, may pass by before it again visits the territory; on the other hand it may appear regularly for several seasons. The vagaries of its wanderings are not to be predicted.

The species usually occurs in flocks, and if food is plentiful and the birds are not molested they may become quite tame. Food put out for them in winter may sometimes induce them to remain in the vicinity.

The evening grosbeak can scarcely be called even a "late spring bird" in the Oneida Lake region, for ordinarily it moves northward late in February, or in March at the very latest. The occurrence of the bird here in early May and its apparent absence from the region during the late spring of 1929, is a further illustration of the irregularity of movement of this unique member of the family.

Little is known of the nesting habits of the eastern evening grosbeak, but it is said to breed in "western Alberta" (A. O. U. Check-List, 1910, p. 241), and to winter "more or less irregularly" as far south as Kentucky.

The seeds of maple, ash, elder, box elder, cherry, dogwood, wild cherry and snowberry make up the bulk of the food of the eastern evening grosbeak. This bird "has no pronounced tendencies either for good or harm, but may well be protected for its interesting habits and beauty." (McAtee, 1926, p. 56.)

Eastern Purple Finch. *Carpodacus purpureus purpureus* (Gmelin).

This melodious and attractive bird often engages the attention of the householder and gardener as well as of the ornithologist. It breeds in most parts of the State, including the Oneida Lake territory where it occurs sparingly all through the summer in some of the tracts of dense mixed woods on the north side of the lake, and even in the village of Cleveland. In the southern part of the State it is said to be a permanent resident; ". . . although rare in summer and uncommon throughout the winter months . . . I found it one of the common breeding species throughout the spruce and balsam belt of the Adirondacks." (Eaton, 1914, p. 263.)

Like some of its near relatives such as the pine grosbeak, the evening grosbeak and the red crossbill, the purple finch is more or less erratic in its distribution and occurrence. As a migrant it is likely to appear in the Oneida Lake region in March or early April. After May 15, scattering individuals, some of which undoubtedly are breeding birds, are seen in suitable localities throughout the summer.

During May, I have commonly seen the bird in the Short Point, Maple Bay, Lower South Bay, Hitchcock Point, West Monroe, Cleveland and

Constantia districts. At Lower South Bay I have sometimes seen it about dooryards, in full song and feeding upon apple buds. This finch is gregarious and at this season, in particular, mixed flocks of males and females are often seen. Usually the flocks are small, averaging from five to six birds to a dozen or more. On May 8, 1929, in the vicinity of Hall Island in the Cicero Swamp south of Lower South Bay, I saw a flock of about fifty birds flying low above the swamp. This is the largest group that I have seen in the region.

During June, the singing continues, but the birds are usually found singly or in little groups of two or three or four individuals. It is in this month that the greatest vocal ability is exhibited. Usually the singer selects the top of a tall hemlock, maple or aspen, standing in a more or less open area surrounded by denser woods, from which to pour forth the nuptial song, "a sweet-toned, carelessly flowing warble," similar to, but sweeter and more varied than the song of the warbling vireo.

On June 20, 1928, in the private grounds surrounding the F. C. Soule summer home north of Cleveland, several males in high breeding plumage were singing enthusiastically from the tops of tall, sparsely distributed trees; both males and females were here in numbers and I feel sure that some of the females, too, were singing. A few days later I saw a young male, evidently not having acquired the first postnuptial molt, but with a distinctly rosy tint to the streaked plumage, singing away in the top of a dead tree with as much vigor and ability as any full-plumaged male.

During this month also I have encountered singing males in the Muskrat Bay district, Kibby Lake, Cleveland and mouth of Chittenango Creek districts, as well as in a cedar-hemlock bog seven miles southwest of Lower South Bay. Though the birds occur here sparingly it is altogether likely that they breed in all these places as well as, perhaps, in the Cicero Swamp south of Lower South Bay. Numerous field observations convince me that the females sing, in some cases at least, almost as well as the males.

I have seldom seen the purple finch here in July or August. On July 22, 1929, I heard a bird singing from a hemlock in the village of Cleveland, but ordinarily the late summer song is weak and featureless as compared with that of the breeding season.

While I have found no nests of the purple finch in the territory in question, the circumstantial evidence available points to the likelihood that the bird breeds here. The abundance of individuals in a few suitable breeding places such as the Vandercamp woods, Kibby Lake and other localities in the Cleveland district, during the breeding season, constitutes part of this evidence. Furthermore, on June 20, 1928, in the private grounds at Vandercamp woods, I saw a female feeding a young one not long out of the nest. The youngster was perched thirty feet up on the limb of a tree where from time to time, it eagerly accepted nourishment. The nest is said to be constructed of twigs, grasses and rootlets lined with long hairs and placed from five to thirty feet from the ground in coniferous trees. The usual complement of five eggs is ordinarily laid in late May or early June.

This bird is largely vegetarian in its food habits. In spring the buds of trees, frequently of cultivated ones such as peach, cherry and apple, constitute one of its favorite items of diet. At this season I have observed it feeding freely on the buds of apple and also of aspen and elm. Later, according to Eaton (*loc. cit.*, p. 264), it feeds also on green cherries, "green berries of the fly honeysuckle, viburnum and ironwoods and, in the fall, on the ripened fruit of the red cedar, white ash, hemlock and nearly any species of seed-bearing tree." It is highly arboreal and seldom visits the ground.

The size and rose-red color of the male will easily distinguish individuals of that sex; the female has the upper parts dark grayish brown finely streaked with black; the under parts, too, heavily streaked. In addition, the broad whitish line above the eye, the stout, conical bill and the distinctly emarginate tail are useful field characters.

Northern Pine Siskin. *Spinus pinus pinus* (Wilson).

Another more or less erratic wanderer is the streaked grayish brown, highly gregarious and arboreal northern pine siskin. The bases of the tail feathers, except the middle pair, and the bases of the wing feathers are yellow and will serve as good field characters in distinguishing it from any of the other "sparrows."

While this bird is likely to be found in the region at any time from mid-October to early June, it is just as likely to be absent for one or two or even more seasons in succession.

In the course of my field work in the present territory I came upon the northern pine siskin only once, the morning of May 7, 1929, in the Van Antwerp woods, an isolated beech-maple-birch-hemlock tract near Lower South Bay. Here a flock of about fifteen or twenty individuals was feeding in a compact group on the fresh buds of hemlock. They fed upon nothing else during the half-hour that I watched them, although several times they moved in a body from one tree to another. In their feeding activities they often hang head downward at the end of a bough after the manner of goldfinches. Their low sharp note has a nasal twang and sounds something like "chee-a." The birds in question appeared to be quite unafraid while feeding, but when two of them left their fellows and settled on the ground only about ten feet from me, the slightest move on my part frightened them away. As they moved through the woods they were accompanied by a number of myrtle warblers and ruby-crowned kinglets, and a Nashville warbler.

Although large flocks of these birds sometimes are found in late fall and early spring, south of their breeding range which is mainly in the Canadian zone, one would expect the numerous beech-and-hemlock woods areas and alder bogs about Oneida Lake to attract them more frequently than this single record would indicate.

Eastern Goldfinch. *Spinus tristis tristis* (Linnaeus).

Although less common in winter than in summer, the goldfinch is a permanent resident in the Oneida Lake region. Throughout the summer it is

fairly common and generally distributed in the territory where it frequents the clearings along the lake as well as the shade trees and orchards in the vicinity of country homes and villages. It is not a forest-loving bird.

Since the males of this species do not change from their somber, olive-brown and greenish coat of winter to the brilliant and contrasty hues of lemon-yellow, black and white until late April or early May, the eastern goldfinch is popularly recognized less often in the cold months than in summer. However, with the assumption of this showy livery by the males, the attainment of a pleasing cheerful warble and the tendency for both males and females to go about in mixed flocks of some size, this bird brings itself again to popular attention.

In the breeding plumage, the male of this little finch is one of our most strikingly colored birds and his plaintive call "*per-chic-o-ree*," often uttered as he drives through the air in easy undulating fashion, is always a cheerful and delightful sound. The song is a sweet, varied, canary-like warble. Often, particularly in spring and early summer, the birds sing together in flocks as they move from place to place among the tree-tops or flit about the fields and gardens. Sometimes the song is uttered while the birds are at rest, or while they are in full flight. Their singing continues into late summer, well after many of the other birds have ceased vocalizing. I have heard the goldfinch performing energetically as late as mid-August. Perhaps this continuation of its singing throughout the summer is associated with the comparatively late nesting season.

On account of its similarity both in voice and appearance to the cage canary—to which it is closely related—the goldfinch is sometimes popularly known as the "wild canary." This name also is frequently though improperly applied to the yellow warbler, so that the vernacular nomenclature, in this instance at least, is somewhat confusing.

During the entire month of May flocks of eastern goldfinches are to be found almost everywhere about Oneida Lake, singing, and feeding on the buds of apple or the seeds of elm and other trees. Old orchards are a favorite resort of the bird at this season. At this season one of the call notes, a pleasing, musical "*pee-e-e-k*" is very frequently given, which usually attracts popular attention to the bird. The small isolated wooded tracts and the open fields appeal to it and although a considerable local movement is displayed at this season it is without definite direction or objective. Often small flocks can be seen and heard as they pass high above the extensive wooded area north of Cleveland; they may even stop to rest and feed or sing in some of the trees, but they soon move on again.

The high, cleared or sparsely wooded north shore in the vicinity of Cleveland and Jewell seems to be almost as popular as the Maple Bay, Hitchcock Point, Short Point and other south shore districts. In late May the tall trees on Frenchman and Dunham islands are favorite resting places for the bird. The many fine tall trees in the village of Central Square attract the goldfinch in numbers; likewise the Cicero Swamp south of Bridgeport, Lower South Bay and Clay; and the small isolated woodlands such as the Emmons woods, the

Van Antwerp woods and similar tracts elsewhere. Indeed, the bird occurs rather commonly everywhere but in the deep woods.

Throughout June, also, the goldfinch continues its local wanderings, indulging its sociable tendencies and singing blithely in trees and orchards and on roadside telephone wires. It becomes then one of the most noticeable local species of birds. At this season I have sometimes seen purple finches and goldfinches feeding together in the same tree, singing and chattering away as though enjoying each other's company. Several times in the village of Cleveland this association was manifest. In the district south of Bridgeport and Lakeport, roadside and open-field groups of some ten to twenty birds are not uncommon.

Early in July, some diminution in the average size of the flocks is discernible and, beginning about July 5, the birds usually go about in pairs or in small groups of about four to eight individuals. At this season, too, the seeds of the thistle become available for food and the birds often can be seen perched on one of these tall spiny plants tearing the downy heads to pieces in order to reach one of their favorite items of diet.

The males are now in full song. Nest building sometimes begins toward the close of June, but the weeks of July and early August, in this territory at least, are the period of greatest breeding activity.

Fine grass, strips of bark, the epidermis of milkweed and moss make up the bulk of the coarser nesting materials, with a thick lining of thistledown. The general prevalence of this down in the nest of the goldfinch is accountable for one of its common names, "thistle-bird." The nest is placed at a height from five to thirty feet above the ground, in a tree or bush, and is usually well concealed by the surrounding foliage. Four or five bluish white eggs make up the average clutch.

On July 26, 1928, we found the goldfinch common along the roadsides and open fields in the vicinity of Bernhard Bay. Just east of the village a pair of these birds was observed feeding on the heads of Canada thistle. I watched a male assiduously attack and tear apart a head half an inch in diameter and feed upon the seeds. Within five minutes the bird had this head well destroyed. As I watched him at a short distance through my field glasses, a female arrived on the scene and after driving the male about from one head to another she, too, started to feed. After a few moments she began collecting down, cramming her bill with what seemed to me a surprising amount of the soft material, then flew to a nearby hard maple tree where a nest had just been begun. The nest was placed about thirty feet up and toward the end of a long branch overhanging the much traveled State highway. On July 30 the domicile had been completed and the female was sitting in it. Young could scarcely have left this nest before mid-August.

Sadler (1926, p. 14) records a nest with five young on August 9, 1915, and Eaton (1910, Sec. 3, pt. 16) lists the species as breeding in Oswego County on June 12. Dr. C. E. Johnson reports that on August 23, 1928, he found a nest in which was a small nestling and three unhatched eggs. This nest was about

eight feet from the ground, on a branch of a willow along Mud Creek, less than one-half mile from Oneida Lake.

Toward mid-August, after the nesting activities are well over or completed, the bird again becomes conspicuously abundant in localities with open low growths of shrubbery and saplings, and about orchards in the vicinity of human habitations. Altogether this dainty member of the sparrow family is one of the most widespread and conspicuous elements of the late summer bird fauna of the region. Not only from the viewpoint of its beauty and song, but from the utilitarian aspect as well, the bird merits the popular favor that is accorded it.

As with the typical sparrows, the principal items in the food of the goldfinch are weed seeds, those of the thistle and the dandelion being particularly relished. Early in the season, I have often found the birds feeding on the buds of apple trees; but the fruits of elm and ash also seem to be favorite foods. Garden flowers such as sunflower, zinnia and coreopsis are known to attract the species. During late summer I have observed goldfinches feeding to some extent on cultivated grain; and on August 13, 1928, in the Lower South Bay district I found them feeding in numbers on the seeds of buckwheat. Forbush (1913, p. 233) says that "The seeds of wild clematis, wild sunflowers and ragweed are much sought by them. Goldfinches feed their young largely on plant lice, caterpillars, small grasshoppers, and beetles. During the spring, when unhampered by family cares, and wandering through fields and orchards, they feed considerably on cankerworms."

General coloration of adult male in summer, bright canary-yellow; crown, wings and tail black marked with white. Adult female with upper parts brownish olive; under parts grayish white tinged with yellowish; wings and tail similar to those of male, but more brownish. Male in winter similar to female, but wings and tail distinctly blackish.

Red Crossbill. *Loxia curvirostra pusilla* Gloger.

No less erratic in its wanderings and occurrence than the eastern evening grosbeak is this beautifully colored, gregarious and highly arboreal representative of the family.

It was with some surprise and no little satisfaction that on the morning of May 20, 1929, I came upon a small group of crossbills in deep hemlock woods, known locally as the Widrig woods, about two and one-half miles northeast of Cleveland. This tract is low and boggy in places and during the summer months, at least, not often visited by humans. Maple, birch and beech are interspersed with the hemlock in the higher portions of this tract. A short distance from the point where I first saw the crossbills I saw on the same day, two white-tailed deer.

There were at least three birds, one male and two females, in the group, but in addition to these, which I could plainly see, I think there were a few others hidden by the boughs. Apparently the birds were feeding on hemlock buds, low down in the trees, from three to ten feet above the ground. In their quest they climbed about among the branches, using both bills and feet. Some-

times they hung head downward while working on the buds. While feeding they uttered a few short, low, whistled notes, as though audibly indicating their satisfaction with one another's company and with the world in general. The birds were wary and quickly flew away among the dense growth of small hemlocks as I attempted to follow them.

Although somewhat erratic, both as to nesting time and to distribution during that important season, the red crossbill breeds chiefly in the Boreal zone. It occurs as a common summer resident in the spruce forests of the Adirondacks, but in other parts of the State it is an irregular winter visitant. It may occur in numbers in a given locality during one winter, or for several in succession; then again it may be absent for several winters, to reappear in either winter or summer without warning. Its occurrence in a given locality seems to be dependent in some measure, at least, upon the abundance of its favorite food. Even in summer it may appear in parts of the State which are ordinarily outside its range at that season.

It is said that more than nine-tenths of the winter food of the crossbill consists of the seeds of coniferous trees, those of various pines as well as of spruce, hemlock and larch. In summer also, a considerable portion of its food consists of seeds of conifers. So far as its food habits are concerned the crossbill is in general neutral, and in beauty it ranks high among our native species, so that its presence in the Oneida Lake region may be looked upon only with favor.

The name "crossbill" is given this bird and its congeners on account of the fact that its elongate, sharply pointed upper and lower mandibles are crossed when the bill is closed. The male of the present species is a brick red, brighter on the head, breast and rump; the female is grayish olive streaked with dusky; yellowish on breast and rump.

Red-eyed Towhee. *Pipilo erythrophthalmus erythrophthalmus* (Linnaeus).

This attractive bird is a common summer resident in the second growth thickets and dry brushy or shrubby hillsides which are so common in the territory on the north side of Oneida Lake. Elsewhere in the region I have not found the towhee in any numbers. Early spring arrivals from the winter abode, mostly in the Southern and Southwestern States, may be expected about April 15. However, I believe that the bulk of the birds do not arrive here until after May 1, for I have seen the species only sparingly until about the 10th of this month. The autumnal movement occurs principally in the first half of October. Occasionally, individuals may spend the winter in well protected parts of the territory, but it is essentially a migratory species.

In the Oneida Lake region the center of abundance of the towhee certainly lies in the Cleveland district, for in the cut-over brushy tracts that occur all through the Soule, Delahunt, Widrig and other properties in this immediate territory, this bird is more abundant than elsewhere. North of the village of North Bay there are cut-over thicketed areas of great extent, and here also the bird is common. A field note under date of July 18, 1929, gives some notion of the conditions surrounding the species here.

"The towhee is very common in the blueberry thickets in the Delahunt woods which is one of the principal strongholds of this bird in the region. Cut-over areas similar to this occur in other places here on the north side of the lake. The principal growth is blueberry interspersed with small aspen and maple saplings." The shrubby thickets often found along the edges of woods bordering hillside pastures are favorite retreats of this bird, and such habitats are most frequent in the North Bay, Jewell, Cleveland, Camden and Constantia districts.

This local concentration of the species in the territory north of the lake does not mean that it does not occur, even rather commonly, elsewhere in the region. In the Oakland Beach and Sylvan Beach districts I found the bird sparingly, and it occurs in small numbers in the woods south of Lakeport and Bridgeport. However, these wooded areas are for the most part low-lying, swampy tracts and do not support much undergrowth or a great amount of shrubbery about their margins and so have not the appeal for the towhee that is offered by the high, dry, second growth tracts lying in the northern portion of the territory under consideration. Thicketed fence rows in the Hitchcock Point, Lower South Bay and West Monroe districts also harbor a few towhees.

Early in the season the red-eyed towhee is frequently seen about human habitations and villages. Indeed, my first record for the season of 1929, was in the outskirts of Bridgeport. As the breeding season comes on, the birds repair to the outlying brushy districts, sometimes remaining in the immediate vicinity of human habitations that are in the midst of clearings.

After the breeding season the birds congregate in numbers along with robins, catbirds, cedar waxwings, Baltimore orioles and song sparrows, in the blueberry and pin cherry thickets which abound in many of the north-side districts. The concentration of the towhee, both adults and young of the year, in such situations is very marked from late July on through August.

Evidently the status of the red-eyed towhee in the Oneida Lake region has changed considerably within the "past thirty years, for while this bird is now a common summer resident in more or less restricted sections, Bagg (1900, p. 178) makes the following comment regarding its status in 1897: "A pair was taken in the town of Vienna, about two miles northeast of the village of North Bay, July 8, 1897. Our fourth record but all the others were migrants."

The red-eyed towhee is a highly terrestrial bird usually nesting upon the ground and finding there the greater amount of its food. It is an active, energetic, nervous creature, constantly hopping about and scratching the dry leaves in brushy thickets as it searches for food. On account of this habit one of the common names it has acquired—"ground robin"—is peculiarly fitting. Usually the search for food is punctuated at frequent intervals by the sharp, clear "*chewink*" note which forms the basis for another common name "*chewink*," by which the bird is frequently known. And still another note, the familiar and more or less ventriloquial "*tow-hee*" or

"tow-hee-e-e" is responsible for the most generally accepted common name of the species. While both these notes are more frequently given when the bird is on the ground, it usually mounts to the limb of a bush or low tree to give vent to its more or less variable song of two notes followed by a trill. Bright, sunshiny days seem to offer more inducement to singing on the part of this bird than do cloudy ones. It is an inveterate singer and continues its vocal efforts well into August, but some diminution of its energy is noticeable late in July.

The nest of the towhee is placed on or near the ground. All the nests that I have seen were on the ground; but sometimes a low bush serves as a support or hiding place for it. Dead leaves, grass and strips of bark constitute the bulk of the materials, with a lining of fine grass. The eggs number four or five, whitish and finely and uniformly speckled with reddish brown. Frequently heavier markings decorate the larger end.

On June 25, 1928, at the Vandercamp woods northwest of Cleveland, I saw two families of young birds that had just left the nest and were closely attended by their very solicitous parents. These birds were in bushy thickets along the margin of woods. The species was common here throughout the summer. On July 18, 1929, at the Delahunt woods near Cleveland, I saw young of the year that had been out of the nest about a week or ten days. This also is a typical breeding place.

That the towhee breeds much more generally in this region than my few records indicate can not be doubted.

As suggested earlier, the food of the towhee or chewink is gleaned mostly from the forest floor. The studies of McAtee (1926, p. 64) show that "About three-tenths of the food is animal matter and seven-tenths vegetable. Of the latter portion seeds, mast and wild fruits are the important items." Beetles, moths, caterpillars, bugs and ants constitute the bulk of the animal food, while spiders, snails, millipeds and sowbugs contribute a smaller share.

Among the insects taken are considerable numbers of forms destructive to forest trees, and so this bird, too, lends its assistance toward holding in check certain enemies of our forests.

Male with the upper parts, throat and breast black; belly white; sides and flanks rufous. Tail black, the three outer feathers conspicuously tipped or spotted with white. Iris red. The female has grayish brown where the male is black and the general coloration also is duller. In flight the white areas at the base of the primaries and on the tail show conspicuously.

Eastern Savannah Sparrow. *Passerculus sandwichensis savanna* (Wilson).

Among the native representatives of the family in the region this highly terrestrial sparrow ranks next below the song sparrow in point of abundance. It is, I believe, commoner than the vesper sparrow and certainly much commoner than the grasshopper sparrow. The great expanse of low, wet, grassy fields so prevalent in the territory immediately to the south of

the lake, as well as the marshy, grass-covered swales that dot the north shore districts, afford habitats in which the Savannah sparrow, bobolink and meadowlark are all much at home. The first spring arrivals from the winter home which, in the East, extends from New Jersey on southward to Cuba and Mexico, may be expected late in March or early in April. The autumnal movement takes place largely in October. It is often preceded and accompanied by a more or less evident flocking.

If our observations of the seasons of 1928 and 1929 are significant, they point to the fact that the Savannah sparrow is becoming more abundant in this territory, for it was considerably more plentiful in the latter season than in the former. This is in line with Sadler's statement (1926, p. 14) that "they [Savannah sparrows] are becoming more numerous about Syracuse each year." The low flat meadows in the Lower South Bay, Maple Bay, Bridgeport, Lakeport, Bushnell Point and Whitelaw districts are the local areas of greatest abundance. But the West Monroe, Fish Creek Landing, Cicero Swamp south of Clay and similar districts are not without their quota. In the territory to the north of Oneida Lake, particularly that from Constantia on eastward, low-lying meadows such as this bird prefers are much less extensive. However, as a matter of fact the Savannah sparrow is generally common throughout the region, and outside of the wooded districts and high dry hillsides its distribution locally is fairly uniform.

The following field note regarding the local distribution of the Savannah sparrow was written on July 9, 1928: "Occurs in open fields everywhere and is one of the commonest representatives of the family. While it is partial to open meadows it not infrequently occurs in the vicinity of farm buildings and even at the edges of villages. This is one of the birds that seems to have suffered no decline in its vocal ability as yet for it sings now as persistently and as frequently as at any time during the season." On July 3, 1929, I wrote as follows concerning it: "Very common in open fields south of Bridgeport and Lakeport. In such situations it is by far commoner than the song sparrow. Indeed, this season I have found the bird generally commoner than the song sparrow." And on June 5, 1929, the following comment: "Great numbers of young just out of the nest, flying about and attended by adults in the open fields south of Lakeport. This bird is much commoner than the song sparrow both here and at many places nearer the lake. It is also commoner this season than last."

This little sparrow is very shy and retiring. In addition, its colors blend in so well with the dried grasses and weeds among which it is usually found that detection of the bird is rendered difficult. When followed or disturbed it runs swiftly and does not attempt to fly unless pressed too closely. More than once while looking for this sparrow I have been startled as one of the birds rose with a whirl of wings and a loud "*chip*" almost from beneath my feet, to fly only a short distance before it again sought seclusion in the grass, there to run along swiftly after the manner of a mouse before again taking wing.

Singing is a favorite pastime of the Savannah sparrow and while the results of its efforts can scarcely be called beautiful, one can not help admiring the bird's persistency. The song is usually delivered from a low perch such as a weed stalk, a small bush or a fence post. While it is subject to considerable variation, perhaps it may be best described as "a weak, musical little trill following a grasshopper-like introduction, and is of such small volume that it can be heard but a few rods. It usually resembles "*tsip-tsip-tsip*" *sē-ē-ē S'r-r-r.*" (Chapman, 1914, p. 388.) In some respects the song resembles that of the song sparrow, and the note may even be mistaken for the rather variable song of that bird; at the same time certain characteristics of the song of the eastern grasshopper sparrow are exhibited.

In the Lower South Bay and other districts I have on several occasions come upon a veritable chorus of these birds where, of an evening I have searched for their nests. Little indication of the decline of singing is noted until late in July. A field note made during an early morning trip to the district lying south of Clay, July 11, 1929, states that this is "one of the most conspicuous sparrows now because it continues to sing while several of the others are ceasing." Although I have heard it sing as late as mid-August, its vocal efforts cease rapidly after July 25 or thereabouts.

The Savannah sparrow builds its grass nest on the ground in the same type of locality as that chosen by the bobolink. Often a grassy hummock or a surrounding clump of tall grass serves more or less to protect or conceal it. The four or five bluish white eggs are heavily marked with reddish brown. I have not been fortunate enough to find a nest of the bird in the territory in question, but my principal notes regarding its breeding activities may be presented chronologically by months as follows:

"June 7, 1929. Open meadows south side of Panther Lake. Saw an adult bird with bill full of soft-bodied insects alight on an old stone fence along which tall grass and blackberry shrubbery were thick. Young were somewhere near, but I was unable to find the nest.

"June 15, 1929. Common in low, open field adjoining the Van Antwerp woods. Saw one bird carrying food—a moth and a mayfly—for young, but could not find the nest.

"June 17, 1929. Adult carrying food for young in open field along the railroad track south of Clay.

"June 21, 1929. Vicinity of hemlock bog seven miles southwest of Lower South Bay. Very common in open grassy fields, particularly the lowest portions of them. Looked in vain for nests, with several birds immediately around me. Saw one adult carrying food for young.

"June 24, 1929. Very common in open fields all over the flat district south of the lake between Bridgeport and Lakeport. One adult carrying food.

"June 25, 1929. Young out of nest three or four days—the first that I have seen—in low, open, grassy field two and one-half miles southwest of the village of Oneida Lake.

"July 6, 1929. Lower South Bay to Syracuse. Great numbers of young of the year along roadside now.

"July 12, 1929. Very common in low, grassy, reverted field just south of Delmarter Bay. Many young out of nest. Bobolink very common here, too.

"July 20, 1929. Bridgeport and North Manlius districts; common; one bird carrying food.

"August 7, 1929. In the open field sloping up from the Cicero Swamp south of Clay, Mrs. Stoner captured a young Savannah sparrow just out of the nest. It was banded as No. 46420B."

The continuous period over which young out of the nest were found suggests the probability that at least a partial second brood is reared in this territory.

With reference to the food habits of this sparrow, Forbush (1913, pp. 310-311) says: "Nearly half the food of the Savannah Sparrow while in Massachusetts consists of insects, mainly injurious species, such as are eaten by other Sparrows. It is particularly fond of beetles. It eats more ants than do most Sparrows, many cutworms, a few spiders, and some snails. The vegetable food consists largely of the seeds of pigeon grass, panic grass, wild rice and marsh grass." There is no reason to believe that the food of the Savannah sparrow in Central New York differs in any material way from that of Massachusetts birds. The fact that the species is particularly common and is apparently increasing in numbers in the Oneida Lake region enhances its economic status in this territory.

Upper parts streaked with blackish, rufous and ashy; a narrow whitish stripe through the crown. A pale yellow stripe over or before the eye; bend of the wing also yellowish. Under parts white, tinged with buffy and streaked with blackish on the breast, the streaks sometimes more or less grouped in the center of the breast as in the song sparrow.

Eastern Grasshopper Sparrow. *Ammodramus savannarum*
australis Maynard.

This highly terrestrial and secretive little sparrow of the dry open fields is probably often overlooked, but it seems to be a fairly common summer resident in the Oneida Lake region. I have seen it most frequently in May, but my records indicate its presence here all through the summer.

During the breeding season these birds often mount to a low bush or weed in an open field to pour forth the weak, but high-pitched lisping, insect-like "pit-tuck, see-e-e-e-e-e-e-e." I have found them thus performing south of the West Monroe Cemetery, in the Cleveland district, the rolling fields southwest of Clay, Lower South Bay district south of the golf course of the Syracuse Yacht and Country Club, and in fields along the edge of the Cicero Swamp three and a half miles south, and in the Constantia and Vienna districts. The high, rolling, sandy fields in the Oak Orchard district offer suitable habitats for this sparrow, and I have seen it here on more than one occasion. On June 27, 1929, near an unused fence corner in a high dry meadow I heard and saw this bird. Upon investigation I found a well weathered nest of dry grass, lined with fine grass and hair and resting in a slight depression in the ground. The sparrow

persisted in remaining here and I believe it had young out of the nest not far away. Sadler (1926, p. 14) says that the grasshopper sparrow nests at Panther Lake. The dry hillsides on the south side of that lake offer suitable nesting conditions for it.

In spring the arrival of this sparrow may be looked for toward the end of April or early in May; and it returns south again in October.

Meadows, clover fields and reverted pastures on high, dry ground are the favorite haunts of the grasshopper sparrow when it is with us. Its characteristic song is so high-pitched that it is inaudible to many persons unless they are close. The note is audible to my own ears at a distance of between one hundred fifty and two hundred feet. Its habit of rising suddenly, almost from beneath one's feet, is at times somewhat disconcerting. Its flights are usually low and short, and the bird darts into the grass so quickly that one scarcely has time to obtain a fair view of it.

When it is perched on a low bush or a fence post the observer can see to best advantage the unstreaked underparts, the even pointed tail, the median pale buff crown streak and the yellow at the bend of the wing, by which the eastern grasshopper or yellow-winged sparrow may be distinguished.

Eastern Henslow's Sparrow. *Passerherbulus henslowi susurrans* Brewster.

This secretive and retiring sparrow is, no doubt, commoner in the Oneida Lake region than my comparatively few records indicate; but throughout the entire State it is generally regarded as uncommon or rare and of more or less local occurrence. The low swampy meadows along the lake shore just east of the village of Jewell, in the Shackelton Point, Baker Point and Shaw Point districts, and an area four miles southwest of Lower South Bay offer the conditions most suitable for this bird, and I have seen it in all these localities.

In the 1928 season the Henslow's sparrow escaped my observation until June 22, when I saw it at the side of a road leading through a low boggy meadow. Five days later I saw one in a garden back of a dwelling house at Jewell; a low open meadow adjoined. Only two times during July (13th and 30th) did I come upon the species.

In the 1929 season I saw the bird several times and in view of the circumstances I am inclined to think that this species is not so rare as our first season's work suggested. My notes on the Henslow's sparrow for the summer of 1929 follow:

"May 22. Shaw Point district. One Henslow's sparrow; low, open grassy field.

"June 12. One Henslow's sparrow at side of road leading through low, swampy meadow.

"July 24. Found a pair of Henslow's sparrows in a low, open, grassy, hummocky field on high ground two miles north of the village of North Bay. This field had evidently been under cultivation at one time, but has been permitted to revert and now supports a good deal of bulrush (*Scirpus*

sp.) and steeple bush (*Spiraea tomentosa*). My attention was first drawn to the sparrows when one of them sang as it perched on the purple-flowered panicle of a steeple bush. The metallic note was uttered in an excited manner and I believe that young out of the nest were near. The adults kept to the vicinity. Upon close examination of the ground in the immediate territory, my belief that the birds had nested here was strengthened by the finding of an empty nest in a slight concavity in the ground under a small blueberry bush. The nest was constructed of grasses and lined with horsehair.

"July 29. On returning to the field north of the village of North Bay, where I found the pair of Henslow's sparrows on July 24, I saw several of the birds today. Also, in a similar field two miles farther north a number of these sparrows were holding forth. They were singing freely and were quite tame and unsuspicious, permitting me to approach within ten to fifteen yards of them. The species seems to be common in this particular locality.

"July 30. Saw a Henslow's sparrow in a dry grassy field one-half mile south of the village of Fish Creek Landing. Evidently this species is somewhat more widely scattered in the territory than our observations of 1928 indicate."

The above records suggest the probability that Henslow's sparrow nests in the region. Eaton (1914, p. 294) records a nest with eggs from the Syracuse district, June 30, 1887. Sadler (1926, p. 14) says: "Heard it calling 'see-lick' and found it in a wet field at Constantia on the following dates: May 27, 1923, May 18, 1924, and May 16, 1925. It was in the same field each time and the same part of the field."

In some parts of the State the species remains late in the fall. The sum of the available evidence indicates that this sparrow is likely to be seen not infrequently in its favorite haunts about Oneida Lake. That it breeds here, also, can scarcely be doubted. Wet hillside meadows, low fields and sometimes rolling fields in wet places offer the most likely situations and of such there is an abundance in the region.

The rather unusual and distinctive field characters of this secretive bird will aid in its identification. Head and neck pale olive-green; sides of crown black; an olive-green median line through it; back, wing-coverts and middle tail-feathers bright rufous brown or chestnut; the latter are sharply pointed. Under parts white, the breast and sides tinged with buff and streaked with black. When flushed this sparrow darts up suddenly, flies a short distance, then drops into the grass again, so that one is likely to get but a momentary glimpse of the bird.

Eastern Vesper Sparrow. *Pooecetes gramineus gramineus* (Gmelin).

This pleasing terrestrial inhabitant of the open grassy fields is a common summer resident in proper situations in the Oneida Lake region. Even the isolated grassy portions found in the wooded districts north of the lake

have been invaded by this bird, but it is scarcely as common as the Savannah sparrow which chooses somewhat similar habitats.

The eastern vesper sparrow arrives early in the spring and may be expected about March 20 from its winter home which extends from the East Central States to the Gulf Coast. It is a hardy, active bird as well as one of the commoner and more generally distributed species of the region. The autumnal movement occurs mostly in November, but stragglers may be observed in December. Sadler (1926, p. 14) records one on December 27, 1923. Occasionally over-wintering individuals may be found.

The eastern vesper sparrow is partial to fences and hedgerows and open high, grassy fields such as occur in the more rolling districts of the territory to the south of Oneida Lake as well as in the cleared sections north of Constantia, Cleveland and Jewell. This sparrow and the eastern Savannah sparrow are the two commonest inhabitants of such situations, but the Savannah is the commoner of the two and occupies the damper situations and wet meadows while the present species prefers the higher ground. Not only do the rolling fields in the Lower South Bay, Maple Bay and Bridgeport districts appeal to this bird, but also the grassy margins of woodland in the Oak Orchard and similar districts, as well as the dry, open hillsides in the Maple Flats, Constantia Center, Panther Lake and Whig Hill sections. In burned-over and cut-over wooded sections it is often found in company with the field sparrow. Fields with a scant cover of weeds and heavier vegetation are preferred to meadows with short grass covering. While such conditions were represented in a great number of places throughout the territory under consideration, during both the 1928 and 1929 seasons, we found the vesper sparrow commoner in the Oak Orchard district than elsewhere. A field note under date of July 9, 1928, gives some notion of the situation there.

"This bird of the open upland fields is not so common as either the song sparrow or the Savannah sparrow, but its notes are heard on all sides; its vocal ability seems to be in no way diminished or impaired as yet. On the dry hills and open fields along the edge of Dutcher's woods this bird occurs more commonly than I have seen it elsewhere. Extensive sand pits are near by, and the soil is dry and sandy, supporting, where it has not been cultivated, a growth of wild strawberry and dewberry (*Rubus villosus* Ait.). The dewberry was thicker here than I have seen it elsewhere, and these sparrows find in its tangles concealment for their nests.

"Mrs. Stoner found a nest here containing three eggs. It was placed in a slight depression in the ground, and constructed of grass and rootlets with a thin lining of horsehair (Fig. 233). It was well concealed by dewberry and strawberry leaves and by small ferns and weeds growing among the berry vines. When flushed the nesting bird ran along the ground for some distance before taking flight."

Another locality in which we found the vesper sparrow in numbers was the territory south of Black Creek, some four miles south of Oneida Lake and between Lakeport and Bridgeport. The open fields and margins

of the higher and drier woods here offer abundant feeding and nesting situations for this sparrow.

An interesting example of local distribution was noted by the fact that in the North Bay and Vienna districts—the highest points in the immediate vicinity of Oneida Lake—the vesper sparrow was much more common than in the similar but lower territory of Fish Creek Landing and environs, less than two miles away.

On the whole, I should say that of the native sparrows in the region the present species occupies third place in point of numbers, being exceeded in abundance by the song sparrow and also, I think, by the Savannah sparrow.

The vesper sparrow is a frequent visitor to plowed fields which have been made ready for some crop, or in which corn or oats or other grain is sprouting. Numbers of the birds, too, often are seen along the highways, and sometimes on unpaved stretches they run along before an approaching motor car for some distance before taking flight, when, with a quick dart and a flirt of the tail—in which the white outer feathers then show to advantage—the bird flies to a tree or fence post of the near by field, often to begin at once its plaintive song.

The vesper sparrow is an inveterate songster, and its favorite periods for singing are early morning, late afternoon and early evening. I have, however, heard it singing at all other times of the day, even during the hottest part of an early July afternoon. Its loud, clear, tremulous song, somewhat like that of the song sparrow, but with the vigorous tone of that bird replaced by a more deliberate and querulous quality, is quite distinctive. A low perch such as the branch of a sapling or small tree or a fence post is usually chosen while singing.

A field note under date of July 17, 1928, states that, "This bird, too, seems to be losing some of its singing ability for it is not now so persistent in its song as it was a few weeks ago."

This is one of the ground-nesting sparrows. The type of nest and the surrounding conditions frequently chosen are well illustrated in a preceding paragraph relating to our observations on July 9. Four eggs make up the usual complement; they are grayish white or bluish white with brownish spots. Eaton (1914, pp. 286-287), in writing of New York State, says: "Two broods are reared in a season in this latitude. The first nestful of fresh eggs may be found from the 28th of April to the 20th of May. Later sets are frequently observed from the 20th of June to the 25th of July."

From what I have observed of breeding conditions in this region, I am inclined to believe that nesting of the bird before late May at the earliest is very unusual and that, at most, only a partial second brood is reared here. Our findings point toward such a conclusion. Young out of the nest and attended by the adults were first observed south of Lakeport on July 3, 1929. The nest above noted was discovered on July 9. On July 21, 1928, at Oak Orchard, adults were carrying food for young in the nest; many

nests which evidently had been but recently abandoned were found here at this time. On July 22, 1929, adults were feeding young able to fly; and from mid-July on to early August, young of the year became increasingly common in the vegetation and along roadsides where particularly favorable nesting sites were available.

As the season advances young vesper and chipping sparrows often congregate more or less together on roadside telephone wires and trees in open places. Both species, too, frequent the blueberry and aspen thickets to some extent, but such situations appeal less to these birds than to many others.

"In summer most of the food of this bird consists of insects of which beetles and grasshoppers form the bulk . . . Grasshoppers form the principal food in mid-summer; cutworms are also eaten, and the bird does good work as an insect eater in field and garden. It is also useful as a destroyer of weed seeds, eating less grass seed than some other Sparrows, but a great variety of the seeds of weeds which it finds in cornfields and other fields, and in gardens." (Forbush, 1913, p. 312.)

Upper parts brownish gray; under parts whitish, the breast and sides streaked with black and brownish. Lesser wing-coverts bright rufous; the presence of the patch is responsible for one of the common names of the bird, "bay-winged bunting." Tail blackish, the outer feathers mostly white. This characteristic is helpful in field identification of the species.

Slate-colored Junco. *Junco hyemalis hyemalis* (Linnaeus).

Apparently the slate-colored junco is present only as a winter resident in the Oneida Lake region. Our latest spring record of its occurrence here for the 1928 season is May 4, and for the 1929 season May 9.

During the period included in our observations this unsuspicious, approachable bird occurred in some numbers during the first few days of May, not only in the bushes along the lake shore, in the vicinity of Lower South Bay, but also in the dooryards, weedy gardens and orchards of that district. On May 8, several were seen in the Shackelton Point district and in an elm and cedar bog two and a half miles southeast of the Point. On May 9, it was still fairly common at the edge of the Cicero Swamp south of Lower South Bay. It seems that birds in the outlying districts may remain a little longer than those in settled communities. Apparently the last few birds do not straggle out individually as they move northward but move on *en masse*, else we should have noted a more gradual depletion in their ranks. Although I was in the field almost every day during May, I failed to find the birds after May 9. Possibly they may be present a little later in the season in some of the thickets on the north side of the lake. Sadler (1926, p. 15) gives the latest spring date as May 30, 1917.

"In New York this is a very abundant species, one of the commonest birds nesting throughout the Catskill and Adirondack districts, and also fairly common as a breeding species in the highlands of western New York which lie above the 1200-foot line. A few pairs are also found in many of the colder swamps and gulleys of central and western New York as summer residents. In

the warmer portions of the State it is a very abundant migrant in April and October, and a common or fairly common winter resident. Throughout the lowlands of western and central New York and the Hudson Valley the junco passes northward from the 22d of April to the 5th of May." (Eaton, 1914, p. 312.)

The slate-colored junco, commonly called "snowbird," usually occurs in flocks, sometimes with tree sparrows and white-throated sparrows. It is easily recognized by its whitish bill and white outer tail-feathers which show conspicuously while the bird is in flight, particularly as it gets under way. The sharp metallic alarm notes are the ones most frequently heard, but the bird possesses a song—simple, trill-like and monotonous—something like that of the chipping sparrow, but more metallic and uttered perhaps somewhat more slowly.

This bird is highly beneficial in that it destroys great quantities of weed seeds during the autumn, winter and spring seasons. The seeds of smartweed, pigweed, pigeon grass, crab grass, dock and lamb's quarters are the favorite ones while such wild fruits as blueberries, blackberries and elderberries also are taken. A good many destructive insects such as plant lice, flea-beetles, leaf hoppers, bark beetles, weevils and ants fall victims to these energetic birds which live mostly on the ground or among the undergrowth and lower branches of trees.

Eastern Tree Sparrow. *Spizella arborea arborea* (Wilson).

It was with some surprise that I noted an individual of this species along the roadside near the Louis Will Game Retreat and Breeding Ground two and one-half miles north of Constantia, on May 14, 1928. However, if I had chosen a locality in which to look for a late spring record of the eastern tree sparrow I could not have done better for this is a little-frequented wooded district, with numerous ponds and streams and a great amount of shrubbery.

The only other record I have for this species in the region is of May 9, 1929, when I saw one bird in a roadside brush pile near a clearing in Cicero Swamp south of Lower South Bay. A little later on the same morning I saw several individuals near the edge of a tract of swampy maple woodland just northwest of Hall Island, about a mile from the point where I had seen the former individual.

While the above records are rather late ones for the region, both the 1928 and 1929 seasons were somewhat retarded. The bird is a common winter resident in the State where it appears in numbers in late September and early October and returns north usually between April 10 and 25, but "occasionally being seen as late as the first week in May." (Eaton, 1914, p. 307.)

This somewhat gregarious bird is present in the Oneida Lake region for more than six of the colder months of the year. It is a distinctly beneficial species that usually feeds near the ground in weedy thickets, the seeds of such plants as ragweed, smartweed, pigeon grass and amaranth making up a good share of its diet. The tree sparrow is of further interest in that it is one of the birds whose food habits were first studied in detail many years ago by the

late Professor F. E. L. Beal, who estimated that as a species it destroys 875 tons of weed seed annually in the State of Iowa alone. By way of substantiating his estimate in part he took from the stomach of one bird 700 seeds of pigeon grass.

The chestnut rufous crown, two conspicuous white wing bars, dingy whitish under parts, grayish brown on the sides and a blackish spot on the center of the breast, afford a reliable combination of field characters.

Eastern Chipping Sparrow. *Spizella passerina passerina* (Bechstein).

Orchards, gardens, farmyards and the shade trees and shrubbery about dwellings are the usual haunts of this familiar little sparrow. It is a very common summer resident in such situations throughout the region. Its arrival from its winter home in the Southern States may be expected early in April or even late in March, but I believe that it does not attain its height of abundance locally until early May, for its numbers seem to be augmented continually up to that time. The autumnal movement begins in mid-October and continues well into November.

An inventory of the places in which we have found the eastern chipping sparrow would include practically every district visited in the territory. It occurs in and about the abandoned houses and old orchards on the north side of the lake, as well as about the villages and homes in the open country in the Lower South Bay, Bridgeport, Lakeport and Sylvan Beach districts. It is probably as uniformly distributed and as generally prevalent within the limits of the situations mentioned as any other bird of the region.

The song of the eastern chipping sparrow, while it has good carrying powers, is a low, monotonous, often and rapidly repeated "*chip, chip, chip.*" The bird is a tireless singer and indulges its unmusical vocal habits well into August, but with some indication of decline during the latter days of July. We have also noted that singing ceased or at least is diminished with the completion of the rearing of the first brood toward the close of June; but a renewal of song is more or less noticeable in the early days of July.

This bird possesses an unsuspicious and confiding nature and it often lights on the ground in front of one as one walks along the highway or about the premises of a country home.

The nest of the eastern chipping sparrow is commonly placed from two to twenty feet above the ground in low bushes or in trees. However, in our observations here we have several times come upon nests that had been placed directly on the ground. Evidently this species does not by any means confine its nesting places to elevated situations as some writers lead us to believe.

Nesting materials consist principally of grasses and fine twigs and rootlets. Whether grasses or rootlets predominate in the structure seems to depend largely on which type of material is the more easily obtainable. A lining of long horse hairs completes the habitation. Four or five greenish blue eggs with a wreath of brownish or blackish markings at the larger end make up the usual clutch. I believe that ordinarily two sets are laid here during the season. Some

of our more interesting observations relating to nidification and related activities of the species in the Oneida Lake territory are herewith set forth in chronological order.

"May 14, 1928. West Monroe Cemetery. Nest under construction; it is in a slight depression on the ground under the railing of an iron fence surrounding the cemetery, and about twenty feet from the State highway which at this season carries heavy traffic." (Fig. 234.) Eight days later the female was incubating three eggs. I flushed the bird in order to photograph the nest and eggs, and within five minutes she returned to the nest. After readjusting the eggs and the interior of the nest she settled down contentedly and I photographed her with the camera set up at a distance of three feet. Either the clutch of eggs or the young birds that hatched from them met with misfortune for when I examined the nest a few days later it was empty. Chipmunks, red squirrels or snakes may have been responsible.

"May 27, 1928. Nest in rose bush on front porch of Mrs. Katherine Van Antwerp's residence at Lower South Bay; it contained one egg of the chipping sparrow and one cowbird egg. This nest was abandoned.

"May 28, 1929. A pair in copula; hemlock woods near Cleveland.

"June 8, 1928. Nest in low evergreen tree on lawn of country home one mile west of Big Bay. This nest contained very small young.

"June 14, 1928. Nest two feet from ground in gooseberry bush at a farm house north of Jewell; contained young four or five days old.

"June 18, 1928. Nest on ground in grassy meadow ten yards south of State road about two miles west of Jewell; contained young about ready to leave.

"June 27, 1929. A pair in copula, Oak Orchard district.

"July 3, 1928. Nest with three young about ready to leave; four feet from ground in wisteria vine spreading over a portion of the side of Mrs. Katherine Van Antwerp's house at Lower South Bay.

"July 3, 1929. Young out of nest and able to fly; adults feeding them. William Parker farm about two miles southwest of Lakeport.

"July 6, 1928. Young just out of the nest; roadside tree near Cicero Swamp south of Clay. The adults were very solicitous of the young and kept up a continuous, low, but exceedingly monotonous and shrill chirping in their anxiety for the safety of their brood.

"July 9, 1928. A good many young just leaving nest now and on all sides one hears the sharp '*chip*' of the solicitous parents.

"July 11, 1929. A pair in copula, Lakeport district.

"July 23, 1929. Young not long out of the nest; Cleveland district. These certainly must be second brood birds."

Late in July and early in August the chipping sparrows along with the vesper sparrows seem to concentrate in little groups in the open places along roadsides and about farmhouses and buildings, near the situations, evidently, in which they have been reared.

In the spring and again in late summer the chipping sparrow is markedly terrestrial, evidently finding a considerable part of its food on the ground. In early May, too, I have often seen the birds dart out from the low limb of a

tree to seize a flying insect and return to the perch again much after the manner of a small flycatcher.

That this bird is worthy of the esteem and popularity which it enjoys is indicated by the findings of Beal and McAtee (1918, pp. 23-24) in regard to its food habits.

Of the animal food taken by the chipping sparrow, caterpillars constitute a little more than 14%, beetles 11%, Hymenoptera about 12%, Hemiptera about 8%, and Diptera 3%. Also a few other insects as well as spiders are taken.

About two-thirds of the diet of this sparrow is composed of vegetable matter, of which weed seed makes up more than 50% for the year, and a small amount of grain, probably mostly waste, makes up the remainder.

The preponderance of weed seed and injurious insects taken by this sparrow, coupled with its general distribution and abundance in cultivated districts, cause it to be counted as a highly valuable bird from the viewpoint of agriculture and horticulture.

The small size, deep rufous chestnut crown, black line through the eye and white line above it, the black bill, ashy gray rump and uniform grayish white under parts distinguish this bird.

Eastern Field Sparrow. *Spizella pusilla pusilla* (Wilson).

This small, plaintive-voiced sparrow is a common summer resident in the brushy margins of woodland and in old hillside pastures where thickets have sprung up. Such conditions are more or less characteristic of the territory immediately to the north of Oneida Lake and in this area the bird reaches its greatest abundance locally. It is neither so common nor so generally distributed as the chipping sparrow.

The first spring arrivals of the field sparrow may be expected early in April, possibly late in March. The autumnal movement to the winter range which, in the East extends from New Jersey southward to the Gulf, begins in mid-October.

The "back country" north of Constantia, Cleveland and North Bay seems to be the center of local abundance of the field sparrow. On June 13, 1928, I wrote as follows concerning the bird in the district north of Cleveland: "Abundant; the most abundant sparrow here, and it is *very* abundant for a solitary species. It is one of the characteristic birds of low bushes and partly cleared areas along the edges of woodland; its note is heard on every side." Throughout the north side districts it is particularly common in shrubby thickets, in such situations as are frequented by the indigo bunting and the red-eyed towhee.

A field note of July 23, 1928, comments on the irregularity of occurrence of this bird in the territory: "Yesterday afternoon on a drive from Lower South Bay to North Bay via Sylvan Beach we found field sparrows in some numbers as soon as we reached the more or less wooded area on the north side of the lake. The *presence* of the bird here is quite in contrast to its *absence* on the south side of the lake where more open conditions prevail and where I have seen and heard it only a very few times. This bird affords an interesting

example of restricted *local* distribution." The marked scarcity of this sparrow on the south side of Oneida Lake, as compared with its general occurrence and abundance on the north side had been a point of frequent comment in my field observations. The situation seems to illustrate the influence that local conditions can exert on the distribution of an animal, even one as well endowed with locomotive powers as a bird.

This is *not* a bird of the dense hemlock-maple woods. But as soon as the observer emerges from woods into the partial clearings along the margins, particularly on hillsides where maple saplings and seedlings and dewberry bushes occur, there he finds the field sparrow in numbers. The dividing line, so far as the bird is concerned, is as clear cut and distinct as are the vegetational differences in these two contrasting situations.

Locally, cut-over woods now overgrown with small aspens, wild cherry and small maples also seem to attract the field sparrow. As a rule such places are not inviting to a great variety of birds, but the Nashville warbler, chestnut-sided warbler, indigo bunting and field sparrow are the dominant birds in such places.

Additional localities in which we have found the eastern field sparrow abundant or common include the Maple Flats district, the open parts of the Delahunt and Widrig woods, and Constantia Center and Oak Orchard districts. In the last named locality the birds occurred on cut-over bushy tracts bordering open sandy fields.

And lest it be assumed that the bird occurs but seldom or not at all on the south side of Oneida Lake, let me hasten to say that in the cut-over districts overgrown with aspens and blueberry thickets on the south side of Black Creek, four miles south of the lake shore between Bridgeport and Lakeport, the field sparrow is present in some numbers. This district is higher and drier and more heavily wooded than much of the territory immediately south of the lake, and the conditions here are similar to those noted in the hilly cut-over north side area. However, neither here nor in any other adjacent territory on the south side does the abundance of the field sparrow reach that in the area about Cleveland.

The eastern field sparrow spends a good deal of time on the ground and among the lower shrubbery. It is a rather timid bird, but upon occasions I have approached to within a few feet of it as it sang its fine, clear ventriloquial song. As one hears the weak notes from a little distance one wonders at their surprising carrying qualities. A good deal of individuality and variation are apparent in the song. The first tones are uttered slowly and distinctly and are followed by a rapid run of shorter ones sometimes—usually, I believe—in a descending scale, though frequently in an ascending scale. I have often heard these birds sing in central Florida, and while the song there is recognizable as belonging to the field sparrow it is, indeed, quite different from the finely modulated song of the species here, all through the summer and well into August. However, after the close of July the bird sings less frequently.

This sparrow builds its nest either on the ground or in a low bush or sapling a few feet above it. Grasses, weed stalks and rootlets are used in its construction and the lining consists of fine grass and long hairs. The three to five

bluish white eggs are heavily marked with reddish brown. Ordinarily, I believe, two broods are reared in a season in this region.

On July 24, 1929, in an open, flat, grassy field on the high ground, two miles northwest of the village of North Bay, I found a nest constructed entirely of dried grass with a scanty amount of horse hair as lining. This nest was two feet from the ground in a steeple bush (*Spiraea tomentosa*) which, along with bulrush (*Scirpus cyperinus*), grew in some abundance in a large reverted field. The parents were busy carrying food for the young which evidently had just left the nest for in it I found two pellets of fresh excrement. One adult carried a green lepidopterous larva. Evidently these were second brood young for first brood individuals very likely would have been out of the nest a month earlier.

This sparrow is of some value in destroying insects and the seeds of many weeds. Forbush (1913, p. 302) states that he has found it feeding on cankerworms, tent caterpillars and caterpillars of the brown-tail moth; also that it destroys May beetles, leaf hoppers, and sawflies; but further, that it destroys some useful insects and feeds on cultivated grain. On the whole, however, because the bird distributes its feeding activities over both woodland and cultivated territory it performs good service in helping to hold in check both noxious weeds and destructive insects.

The bright chestnut rufous crown and general coloration above, the pinkish bill and the plain under parts afford a good combination of distinguishing field characters.

White-crowned Sparrow. *Zonotrichia leucophrys leucophrys* (Forster).

One of the most striking and elegant sparrows is the present species. It is sometimes confused with the commoner white-throated sparrow. However, the white-crowned sparrow is decidedly grayer above, the alternate black and white stripes on the head are very conspicuous and it lacks the yellowish mark in front of the eye and the white throat of the white-throated sparrow.

Reports of the nesting of the white-crowned sparrow in the State have been made, but these appear more or less doubtful. However, the species is a common migrant in most parts of New York, arriving between the latter part of April and the middle of May and passing on northward by the end of May, to return again in late September.

In the Oneida Lake region we have observed the white-crowned sparrow in various localities, between May 8 and May 22. On our earliest date the bird was seen in an open tract near a hemlock bog just north of the West Monroe Cemetery. The locality in which it was seen last was the Shaw Point district, where two were observed feeding in white thorn trees near the lake shore.

While the localities in which we have seen the bird are distributed all around the lake, it occurs most commonly in more or less open places such as weed-grown back yards, fence rows and small trees and bushes along the edge of woodland. Very frequently it has been noted in the immediate vicinity of houses and barns, as for example at the Eastwood, Becker and Van Antwerp residences near the lake at Lower South Bay, where it was seen and heard every day dur-

ing the week following May 12, 1928. It seems to be attracted to such situations much more than the white-throat but, so far as my observations here are concerned, it never occurs in such numbers as that species. Usually not more than three or four birds occur together in a given locality. Short Point, Hall Island, Sylvan Beach and Hitchcock Point are other localities where the species has been seen. Our latest dates of observation in spring are May 19, 1928, and May 22, 1929.

White-crowned sparrows are less wary and suspicious than the white-throats and I have approached to within a few feet of them while they sang quite unconcernedly. The song is somewhat like the last half of the white-throat's song, repeated several times "with a peculiar sad cadence and a clear soft whistle." It bears some resemblance also to the rather melancholy song of the vesper sparrow. Saunders (1929a, pp. 161-162) says: "The White-crowned Sparrow begins its song with clear whistled notes and ends with notes in a husky or whispered whistle."

In eastern North America this bird breeds in the Hudsonian and Canadian zones, where it is said to be at its best as a songster.

White-throated Sparrow. *Zonotrichia albicollis* (Gmelin).

No other bird has a more pleasing "personality" or sweeter song than the sociable white-throated sparrow. In the Oneida Lake territory it is mainly a transient, for the near-southern limit of its normal breeding range is reached in the mountains of Pennsylvania and New York. However, the proximity of the Oneida Lake area to the Canadian zone of the Adirondacks renders not unlikely the possibility of breeding white-throats in the region under consideration. Indeed, the general distribution and comparative abundance of the bird all through the summer in certain limited districts about Oneida Lake constitute significant circumstantial evidence.

In this region the white-throat is likely first to appear early in April when it may be seen in pairs or small scattered groups about gardens, lawns and shrubbery in the neighborhood of country homes, and villages, as well as in the outlying shrubby districts and along fence rows. A little later these scattered groups are augmented by new arrivals and in late May the maximum of abundance seems to be attained. About this time also, the main body of the birds moves on northward, but a considerable number repair to some of the outlying swampy districts of the region where they remain throughout the summer. The southward movement begins early in September and continues well through October and even into November and December. It is possible that occasionally a few birds may remain here during the winter, but the species is essentially a migrant and in the East ordinarily winters from southern Pennsylvania southward to Florida and northeastern Mexico.

During the spring movement, white-throated and white-crowned sparrows often associate together in bushy hedgerows, blackberry thickets and similar tangles. Both species are more or less terrestrial in habits and, like the red-eyed towhee, scratch about a good deal in the dry leaves in search of food. At intervals the white-throat stops to utter its high, clear, plaintive whistle which

in New England has been likened to the words "Old Sam Peabody, Peabody, Peabody." The song may be uttered while the bird is on the ground, or as it perches in a low bush among the thickets. A chorus of these melodious songsters is not infrequently met with in some secluded place on a bright May morning. An alarm note, a sharp "*chip*," is often given, and also a softer lisping note which seems to betoken self-satisfaction and contentment.

Although the birds do not sing so persistently in June and July the voice seems to lack none of its quality at that season. I have heard the song at least every week throughout our field studies, even at high noon on hot days in mid-July. Toward the end of July, following the nesting activities, the inclination to sing seems to be renewed, and the birds are heard more frequently than during the preceding five or six weeks.

During May the white-throat is generally distributed throughout the region, but as the season advances it concentrates in the low vegetation in or about outlying swampy thickets, where also, as before remarked, it can be found in some numbers throughout the summer.

That portion of Cicero Swamp which lies about three miles south of Lower South Bay is a favorite retreat of the white-throat, where in late May it is the commonest bird. Its pleasing song is then to be heard all about, but the singers are very shy and keep well to the cover, of which there is an abundance. This, too, is one of the localities where the bird probably breeds.

Dense cedar bogs, too, particularly in situations little frequented by humans, are favorite congregating places of the white-throat. Such bogs occur near Sauers' woods just south of the West Monroe Cemetery.

On June 10, 1929, in a dense grassy willow-alder and high-bush blueberry thicket two miles north of Cleveland, I found a considerable aggregation of these birds. A thick tangle of brushwood, vines, tall grass and burned timber forms an almost impassable barrier to the pedestrian, but affords just the kind of cover that the white-throat seems to prefer. I was in the vicinity of the bog for some time and saw two or three white-throats before I heard any of them sing. After one had begun to sing, several others in the vicinity suddenly joined in, too. This delightful chorus continued for some minutes, when it ceased as suddenly as it had begun.

The cut-over district a mile east of Verona and Sylvan beaches is another local stronghold of the white-throat. Here, on the low boggy ground where aspen and blueberry thickets have taken the place of earlier vegetation, the bird occurs in numbers throughout the summer; and on July 15, 1929, I found young birds not long out of the nest. I looked persistently but in vain for a nest. A week later I found several young of the year well able to fly and shift for themselves. Evidently the bird is skilful in concealing its nest.

In this district on August 13, 1928, I came upon a family of young which had just left the nest and were able to fly a little. The parents were very solicitous.

On June 13, and again on June 27, 1928, I found this sparrow in numbers and heard it singing all through the dense undergrowth of a cedar bog two miles northeast of Cleveland. Again I searched for nests, but without results.

Still another likely nesting place which we discovered on July 22, 1929, was a swampy wooded thicket a mile northeast of Elpis. On this date the birds were singing here continually.

On July 28, 1928, several white-throats in full song were heard in the woods north of the New York, Ontario and Western railroad tracks about a mile northwest of West Vienna.

In general, our conclusion is that the white-throated sparrow is an abundant transient in the region; that throughout May it is generally distributed and as common on the south side of the lake as on the north side; and that by late May and early June the bulk of the birds have moved on northward to nest, but that considerable numbers remain to breed in the outlying burned-over boggy swamps and other tracts of low swampy ground, which are especially to be found in the territory immediately to the north and east of Oneida Lake.

Summer records for the white-throated sparrow from the counties immediately surrounding Oneida Lake are comparatively few. Maxon (1903, p. 265) records it as breeding at two stations near Peterboro, Madison County, and Eaton (1910, sec. 3) lists it as breeding once in Oswego County and in Oneida County.

The white-throat builds its nest on or near the ground, employing in its construction coarse grasses, rootlets, moss and strips of bark; finer materials of this type are used for lining. The four or five eggs are bluish white, finely speckled and heavily blotched with reddish brown.

"About one-fifth of the food of the White-throated Sparrow is derived from the animal kingdom and four-fifths from the vegetable. . . . Weed seeds . . . and grasses are very important elements of vegetable food, but wild fruit composes a larger proportion of the subsistence than is usual among sparrows. . . . Beetles, and ants and other hymenoptera are the largest components of the animal food of the White-throat, with caterpillars, bugs, and flies ranking next." (McAtee, 1926, p. 61.)

In early May I have seen the bird feeding with purple finches on the buds of apple trees, but I suspect that the amount of damage thus caused is rather limited.

The principal field characters of the adult are the white chin and throat, the four black stripes and three white ones on the top and sides of the head, the yellow line or patch before the eye and the yellow on the bend of the wing.

Eastern Fox Sparrow. *Passerella iliaca iliaca* (Merrem).

This large and attractive sparrow is represented in New York State largely as a migrant, although in the southeastern part of the State numbers of the species remain over winter. In eastern United States its winter range extends from the southern parts of New England to the Gulf coast.

In the Oneida Lake territory the first spring arrivals of the eastern fox sparrow may be expected late in March or early in April, and by May 1 the last ones usually have departed for the summer breeding grounds which are essentially coextensive with the Hudsonian zone and include the territory from the Gulf of St. Lawrence to Alaska. Late in September the autumnal movement

becomes apparent in this territory and within a month it has practically ceased, the species being then represented locally only by an occasional straggler.

My notes contain but a single record of the eastern fox sparrow. On May 2, 1928, an individual was observed in the brush and blackberry tangles at the rear of a country home near the shores of Oneida Lake at Lower South Bay.

Like the red-eyed towhee, the fox sparrow is a highly terrestrial species and feeds mostly on the ground. It is more or less gregarious and often occurs in company with juncos and song sparrows, and near the protecting cover of shrubbery. It is a vigorous bird and frequently sets up a considerable disturbance beneath low vegetation as it scratches aside the dry leaves in search of food. Often the search is punctuated by intervals of song, the full-toned outburst of melody usually being delivered from a low perch.

In addition to the large size, the bright reddish brown coloration above, particularly on the tail, the heavily spotted breast and sides and the short bill with yellowish lower mandible are fairly satisfactory field characters.

Swamp Sparrow. *Melospiza georgiana* (Latham).

Wherever its favorite habitats occur in the region the swamp sparrow will be found in numbers. It is a fairly common summer resident in low, swampy thickets and is still more abundant in the grass- and flag-covered marshes and along the flooded banks of the outlying ponds and streams, as well as about the low shores of Oneida Lake, which support a profusion of cat-tails, sedges and long grasses. This bird, I believe, ranks fourth in point of local abundance so far as the native sparrows are concerned, being exceeded in numbers by the song, Savannah and vesper sparrows. With the draining of so many of the outlying swamps and marshes, the distribution of swamp sparrows has become much more localized not only here but throughout its range, for in summer, at least, it does not wander far from its favorite marshes and moist thickets.

The swamp sparrow is a hardy bird and winters in swamps and marshes of southeastern New York as well as on southward to Florida, the Gulf coast and Mexico. First spring arrivals in the Oneida Lake region may be expected late in March, but it is mid-April or later before the bird reaches its peak of abundance locally. Its post-breeding movement occurs in October and early November.

Cat-tail marshes seem to be the favorite haunts of this swamp-loving bird, and wherever such expanses exist there also will be found swamp sparrows in abundance. The largest area of this type that I have visited in the Oneida Lake region is the Cicero Swamp one and a half miles southwest of Clay, and here also this bird is more abundant than elsewhere in the territory.

On June 14, 1929, the following note was written regarding the occurrence of the swamp sparrow here: "Fairly common; seems to prefer more or less mixed type of vegetation such as red-osier dogwood, water willow, arrow arum, swamp loosestrife and cat-tail, rather than the pure cat-tail growths."

Another field note under date of July 6, 1928, relates to conditions here at that season: "Next to the long-billed marsh wren, I believe that the swamp

sparrow is the most abundant passerine bird in the marsh. Possibly it exceeds in abundance the marsh wren, although judging from my observations today I think that the latter is the commoner of the two. Swamp sparrows are nesting and singing in the cat-tails on every hand. Saw adults carrying food for young. After delivering the food they have the habit of mounting to a high perch, such as the top of a cat-tail stalk, a bush or a tree or a telegraph wire, and of bursting into a loud full song."

Smaller cat-tail marshes where we found the swamp sparrow constantly present are situated in the Short Point, Shaw Point, South Bay, Fish Creek railroad station, Coble Point, Big Bay Swamp and Baker Point districts, likewise in the vicinity of the Steding and Parker woods south of the villages of Oneida Lake and Lakeport respectively. Indeed, small outlying growths of roadside cat-tails, such as occur in the outskirts of the village of Cicero and at Gordon Pond and along Black Creek four miles south of Bridgeport, commonly harbor at least a few of these birds.

An extensive grassy marsh just off the Toad Harbor road, about two miles southwest of the village of West Monroe and along the New York, Ontario and Western railroad tracks, is a stronghold of this bird. In fact almost every clump of cat-tail growth in the territory is likely to have the swamp sparrow as an inhabitant.

Nor are the alder and willow and the alder and aspen bogs, such as occur east of the village of North Bay at Shackelton Point, Hitchcock Point and elsewhere throughout the region, overlooked by this unobtrusive sparrow.

It is quite obvious that the ecologic conditions prevailing in general on the south side of Oneida Lake appeal to this bird more than do those in the wooded north-side territory. Yet more or less swampy conditions are so general throughout, that the region as a whole is very suitable as a summer home for the swamp sparrow.

Except when singing, the swamp sparrow is a shy and retiring bird, usually keeping well to the cover of the surrounding vegetation. Like the eastern Savannah sparrow it is more or less terrestrial in its habits, but less so than that bird. Preceding and during the breeding season it is an habitual songster, continuing its vocal efforts well into August. Excerpts from my field notes of two or three dates relate to this and other habits of the bird.

"May 9, 1928. Short Point Bay, swamp and vicinity. Very common in this swamp. Its lively song, somewhat monotonous, yet cheerful and at times resembling that of the song sparrow, at times partaking of the character of the Savannah sparrow's song, seems more musical than the former and less melodious than the latter. So far as my observations go it seldom sings from the ground, but always from a low perch such as the top of a willow tree. Today, at least, this bird was more abundant in the marsh than was the song sparrow.

"July 17, 1928. Cicero Swamp southwest of Clay. Common and singing without apparent diminution in ability. Even after 8:00 P. M., when it was dark, this bird continued to sing, but the performance at this time is not so impulsive and energetic as it is during the day.



Fig. 233. Nest and three eggs of eastern vesper sparrow among dewberry vines at edge of woods. Oak Orchard. July 9, 1928.



Fig. 234. Nest and eggs of eastern chipping sparrow. Nest on ground under iron fence surrounding West Monroe Cemetery. May 22, 1928.

"August 7, 1926. Cicero Swamp southwest of Clay. The swamp sparrow seems to have retained its vocal ability to a more marked degree than either the Savannah or the song sparrow. There are now a good many young swamp sparrows in the swamp, which is the most extensive breeding place that I have found here."

The nest of the swamp sparrow is placed on the ground in marshy situations. Four or five light blue eggs heavily marked with brownish make up the usual complement. It is said (Eaton, 1914, p. 321) that "Two broods are usually reared in a season." We found no occupied nests, although I searched for them many times. Adults carrying food were observed in an alder and aspen bog in the North Bay district on June 25, 1928, and on frequent subsequent occasions. In one instance the bird carried a green lepidopterous larva about two inches long. On August 3, 1928, at the marsh west of the West Monroe railway station, adults were feeding young not long out of the nest. Our observations here, while not conclusive, indicate that at least a small second brood is reared in the season. Sadler (1926, p. 15) records a nest with eggs at Long Branch, May 26.

In all probability this sparrow eats much the same type of food as the song sparrow, for it often frequents similar situations and not infrequently may be seen about the borders of marshes and pools and along the banks of streams, feeding in the wet vegetation. On one occasion, at Hitchcock Point, I saw a swamp sparrow wade into the shallow water up to its belly, then run and dart its bill from side to side after the manner of a sandpiper. Saunders (1926, p. 451) mentions the swamp sparrow feeding on the berries of red-osier dogwood, as I also observed in Cicero Swamp.

The distinguishing field characters of this bird in summer are the chestnut crown shading to black on the forehead; a grayish superciliary line; sides of neck and breast ashy; wing-coverts chestnut; tail short, rufous brown or dull chestnut; under parts not streaked; throat and abdomen white; flanks grayish brown.

Eastern Song Sparrow. *Melospiza melodia melodia* (Wilson).

Without doubt this is the commonest representative of the family in the territory about Oneida Lake. It is an abundant summer resident throughout the region and occupies all types of habitats except the deep forests and the open fields. The low, swampy clearings and bushy sections that are so common, afford the conditions that the bird likes best. Its favorite haunts are the thickets along streams and about lakes and ponds. While occasionally a few individuals may remain in the territory over winter, the song sparrow is essentially a summer resident here, first arriving early in March, though its maximum numbers are not attained until late April. The autumnal migration occurs mainly in November, the species in winter being well distributed from latitude 41° on southward to the Gulf coast.

This bird is another tireless songster, and its pleasing but exceedingly variable lay may be heard from its earliest arrival on through the hot summer

days to mid-August, with scarcely any perceptible diminution of vigor. Cold spring days have little effect upon its disposition to sing and I have heard it performing as cheerily at 45° F. as at 75°. Usually it sings from a low perch. Its song "is more musical than that of the Savannah, Grasshopper or Chipping Sparrows, more varied in pitch than that of the Field Sparrow, and begins with shorter, quicker notes than that of the Vesper Sparrow. Perhaps the commonest form of song begins with three short notes on the same pitch, followed by a trill on a different one, but there are many other forms of beginning." (Saunders, 1923, p. 320.)

Toward mid-July the frequency with which the song sparrow sings diminishes and the quality of its voice changes somewhat. While the song is vigorous in the early morning, it becomes intermittent and irregular as the day advances. However, the inclination to sing also seems to be a matter of individuality for I have heard some individuals sing as enthusiastically in August as in June. On August 8, 1928, at the Cicero Swamp, I heard a bird utter its full song as it winged its way over the swamp. In view of the season this was rather unexpected.

The flight of the song sparrow is accompanied by much "pumping" of the tail. Usually the bird flies from point to point at no great height from the ground, and when disturbed seeks cover in the shrubbery at the first opportunity.

While the song sparrow usually places its nest—built of grasses, rootlets, leaves, bark and long hairs—on the ground, we have several times found nests two or three feet from the ground, in low bushes. I believe that elevated places are more frequently chosen for nests in the vicinity of human habitations than for such as are situated in more natural surroundings. The usual complement of eggs is four or five. They are grayish white marked with brownish. A good deal of variation in markings occurs, but a concentration of spots and blotches is often noted about the larger end of the egg. It is altogether likely that two broods are regularly reared here, and that even a third brood is not unusual, for we have observed young just out of the nest as late as August 13.

Our observations on the song sparrow in the region indicate that its nesting and breeding activities are practically continuous throughout the period from May 1 to August 15. The following extracts from my field notes are arranged chronologically by months and will give an idea of the prevalence and distribution of the bird as well as its nesting and allied activities.

"May 1, 1929. Short Point district; a bird carrying nest material.

"May 3, 1928. Maple Bay; bird carrying nest material.

"May 5, 1928. Lower South Bay and Short Point districts; common everywhere; a pair in copula.

"May 6, 1929. Lower South Bay to Nicholson Point and West Monroe Cemetery. Abundant everywhere; mating.

"May 9, 1928. Short Point swamp and vicinity. Commoner at edge of marsh than in it. One bird collecting nesting material in the form of wet grasses; it appeared deliberately to *select* wet blades of grass even though plenty of dry ones were available.

"May 15, 1929. Nest with five eggs on ground at base of maple seedling (Fig. 232). This is my earliest date for a nest with eggs.

"May 25, 1929. Edge Emmons' woods, west side Big Bay. Nest on ground in clump of marsh grass. This nest contained four song sparrow eggs and two cowbird eggs. This is the first time that I have found more than one egg of a cowbird in a nest. Even though the nest is well hidden, the cowbird seems to have encountered no difficulty in finding it.

"May 28, 1929. Cleveland district. Birds carrying nest material. This still must be the first nesting.

"June 4, 1928. Cicero Swamp three and a half miles south of Lower South Bay. Common along edges of swamp. One bird carrying nesting material.

"June 7, 1928. Hitchcock Point. A bird carrying nest material.

"June 11, 1929. Fish Creek Landing district. Young just out of nest; the first that I have seen this season.

"June 13, 1928. Birds carrying food for young. Soft-bodied insects, mayflies in particular, seem to be a favorite item of food selected for the young." On many subsequent occasions I observed adult birds carrying these insects, which are so abundant in the region.

"June 15, 1928. Bernhard Bay district. Young just out of nest.

"June 27, 1928. Village of Jewell. One adult carrying several mayflies in its bill. Also found a nest with five very small young—about three days old—in syringa bush (*Philadelphus* sp.). It seems altogether probable that these are second brood young. The nest was about four feet from the ground, and the bush was less than ten feet from the front door of an occupied dwelling. These birds take up readily with the conditions about human habitations.

"June 30, 1928. Oakland Beach. Very common in low undergrowth in the sparse woods here. A nest on the ground near a lake shore cottage contained four half-grown nestlings.

"July 3, 1929. Hitchcock Point. Song sparrow abundant here. Saw several birds carrying food and found a nest with five eggs on the ground at the edge of a cleared area.

"July 12, 1929. Shackelton Point. Common. Saw a pair of song sparrows feeding two young cowbirds that were able to fly a little. These young were incessantly calling for food. As if solicitous of the young of his own species, a male cowbird approached the young ones, which perched on the limb of a tree, but at once he was driven away by the song sparrows.

"July 13, 1928. Hitchcock Point at mouth of Chittenango Creek. Banded four nestlings from a nest found here on June 3, when it contained eggs. A pair of adult birds in copula; Shackelton Point.

"July 18, 1929. Delahunt woods near Cleveland. Adults and young of the year able to fly well, in blueberry thickets. The concentration of these birds here is becoming apparent now.

"July 21, 1928. Lower South Bay district. One of the commonest species in the region and certainly the commonest native representative of the family

here. I believe also that in the territory as a whole the song sparrow exceeds the English sparrow in point of numbers. It occurs about houses as well as along wooded areas, nesting commonly on the ground or in low bushes. At the Pattat residence in the Lower South Bay district, a pair has a nest about two feet from the ground in a barberry bush on the front lawn. This nest contains three half-grown song sparrows and a young cowbird. Banded all of them. Another pair has a nest with eggs in a similar bush standing two feet from the house. And two hundred yards away, beside the steps of a lake shore cottage is another nest containing eggs. It seems likely that these are third brood eggs.

"This afternoon at the Dutcher farm in the Oak Orchard district we banded four young that were about ready to leave the nest. This nest was well hidden under a thick growth of dewberry bushes, which grow in profusion on the sandy soil and afford cover for both vesper and song sparrows, although here the former is much the commoner bird.

"July 24, 1928. Frenchman Island. The commonest *solitary* species of bird on the island. Young able to fly well were seen. Earlier in the season adult birds were found here and all evidence indicates that the species nests on this island. The song sparrow also has been observed on Dunham Island.

"July 24, 1929. North Bay district. In a reverted grassy field two miles north of the village I found young out of the nest and attended by the parents. The bird is not so common on the higher, drier and sandy ground as in the lower country in the immediate vicinity of Oneida Lake.

"July 27, 1929. In a low, grassy, reverted field in the Bernhard Bay district, adults were feeding young just out of the nest. The food calls of the young of this and of the Savannah sparrow are heard on all sides. Three adults carrying food were in sight at the same time; two of them carried green larvae while the third held several mayflies in its bill.

"July 28, 1928. Along Fish Creek in the vicinity of Fish Creek Landing, this bird is very common. Saw several adults carrying food, and a good many young of the year.

"July 29, 1929. North Bay district. Moderately common; one adult carrying green larvae.

"August 13, 1928. During the past two weeks adults carrying food have been seen frequently. Near the Fish Creek railroad station I saw today two adults carrying food, and a young bird not long out of the nest and attended by an adult."

The foregoing notations show the general occurrence and abundance of the song sparrow in the region. Except along the low shores immediately adjacent to Oneida Lake and in the vicinity of bushy tangles along the streams and outlying ponds and lakes, it is less common in the north-side districts than in the territory on the south side of the lake. On the north side its place is largely taken by the field and the vesper sparrow.

"About one-third of the Song Sparrow's food is made up of insects and other small animal forms, and two-thirds of seeds and other parts of plants.

Weed seeds are the most important element of the vegetable food and those of grasses, including crab and foxtail grasses, smartweed, ragweed, pigweed and lamb's quarters are preferred. Wild fruit such as elderberries, blackberries, and blueberries also contribute materially to this bird's subsistence." (McAtee, 1926, p. 62.)

In the Oneida Lake region in late summer these birds gather in numbers in the blueberry thickets and the cut-over and burned-over tracts that are overgrown with blueberry, blackberry, wild cherry and pin cherry seedlings. Such places as the Delahunt tract near Cleveland and a similar one near Jewell attract both adults and young of the year at this season.

A good many noxious insects are included in the song sparrow's diet. Of these, beetles, grasshoppers, caterpillars, ants and other Hymenoptera, true bugs and mayflies constitute the major part. Mayflies, as before stated, seem to be a favored article of diet for the young. Possibly this is because these insects are so plentiful in the region.

Undoubtedly the woodlands and cultivated fields are rendered in some measure more productive to man by reason of the presence of this abundant, vivacious, hardy and prolific sparrow. "The Song Sparrow is a bird to cultivate. Friendly, cheery, musical, harmless, gentle, useful—what more can be desired?" (Forbush, 1913, p. 300.)

So far as color is concerned, the principal distinguishing field character of the song sparrow is found in the white under parts, spotted and streaked with blackish on the breast and sides, the marks on the center of the breast becoming confluent to form a large blotch. Blackish marks at sides of throat also tending to coalesce into a triangular patch.

ANNOTATED LIST OF BIRDS BANDED IN THE ONEIDA LAKE REGION

The method of marking birds by means of numbered aluminum bands, furnished by the United States Bureau of Biological Survey, has become a very popular phase of ornithological endeavor during the past ten years. A great mass of interesting and valuable information has been collected in this manner, not only by the returns from the banded birds but also in the handling of the birds incident to the placing of the bands.

Much still remains to be accomplished in this undertaking for scarcely more than a good beginning has been made in bird banding work in this country. Therefore, in an effort to contribute even in a small way to the furtherance of the project as a whole, we banded young birds of suitable size as well as adults as opportunity offered. While no extended search was made for birds for banding purposes solely, it was in many cases necessary to ascertain the breeding status of a bird in the Oneida Lake region by finding the nest; and if a nest contained well developed young, these were tagged. A few adults were also captured and tagged. The results of these findings are set forth in the following pages which contain data on 225 individuals representing the thirty species banded by us during our two seasons' work.

So far as I have learned, only two individuals in this lot, a belted kingfisher and a northern flicker, have been recovered.

Eastern Green Heron. Five young, a week to ten days old, from a nest about 12 feet up in an ash sapling, June 17, 1929. Band Nos. 294926 to 294930 inclusive.

Eastern Sparrow Hawk. Five young from nest about 20 feet up in a maple stub, June 30, 1928. Band Nos. 220493 to 220497 inclusive.

Spotted Sandpiper. Five young, possibly from the same nest; seven to ten days old, July 19, 1928. Nos. 251265 to 251269 inclusive. Also, four young banded on July 24, 1928, with Nos. 251271 to 251274 inclusive.

Common Tern. Two young, approximately one and two weeks old, banded July 9, 1929, Nos. 319023 and 319024. Three other young, probably from the same nest, banded on August 10, 1928, Nos. 522184 to 522186 inclusive.

Eastern Belted Kingfisher. Seven young about 2 weeks old from nest in sand pit. Banded on July 14, 1928, Nos. 220486 to 220492 inclusive. No. 220486 was recovered on August 9, about 30 miles northeast of place of banding. Four other young about a week old from another nest in the same sand pit were banded on June 8, 1929, Nos. 220500 to 220503 inclusive.

Northern Flicker. Five young from nest in a dead apple tree. Banded on July 8, 1928, Nos. 522169 to 522173 inclusive. The occupants of another nest of four in a roadside maple tree were banded on July 26, 1928, Nos. 552180 to 522183 inclusive. No. 522182 was found dying on July 30, more

than a mile from the nest. Four more young from a roadside maple tree were banded on July 5, 1929, Nos. 522197 to 522200 inclusive. On the same date another family of four young was provided with bands Nos. 522201 to 522204 inclusive.

Northern Downy Woodpecker. One young bird from a nest of two individuals was provided with band No. 220504 on July 3, 1929.

Eastern Kingbird. Three young birds from a nest in an apple tree were banded on July 5, 1929, with Nos. 251284, 251285 and 319022.

Northern Crested Flycatcher. A family of five young found six feet above water in a willow tree on July 29, 1929, was banded with Nos. 251279 to 251283 inclusive. Another family of three young living in a nest ten feet above water in a willow tree was also banded on June 29, 1929, with Nos. 319018 to 319020 inclusive.

Eastern Phoebe. Four young from a nest in an abandoned house were banded on July 11, 1929, with Nos. 46414B to 46417B. Six others from a nest on the porch of an abandoned farmhouse were banded May 29, 1928, with Nos. 97933A to 97938A inclusive. Four more young from a nest on the porch of an occupied cottage were provided with bands 97939A to 97942A inclusive. On June 18, 1928 two young from a nest in an unoccupied cottage were banded with Nos. 97943A and 97944A.

Tree Swallow. Four young birds from a nest in a willow stub were banded on June 22, 1929, with Nos. 46405B to 46407B inclusive and 48408B. One incubating adult was provided with band No. 97932A on May 28, 1928.

Bank Swallow. A total of 27 birds were banded as follows: Nos. 46418B and 46419B, probably second brood young, July 30, 1929; No. 97945A, adult captured in burrow June 18, 1929; 97946A, adult captured in another burrow, June 18, 1929; Nos. 97947A to 97949A, young brooded by adult No. 97946A; Nos. 97958A to 97962A, young from another nest, June 21, 1928; 97963A to 97967A, young from one nest, June 23, 1928; Nos. 97968A and 97969A, young from one nest, June 23, 1928; Nos. 97970A to 97972A, young able to fly, from one nest, June 26, 1928; all the above birds were captured in the territory lying immediately to the north and east of Oneida Lake. Nos. 97993A to 97995A, probably second brood young from same nest, July 21, 1928; Nos. 97996A and 97997A, probably second brood young from one nest, July 21, 1928. These birds were banded five miles southwest of Oneida Lake.

Barn Swallow. Five young birds about old enough to leave nest. Banded on July 3, 1929, with Nos. 46409B to 46413B inclusive.

Eastern Crow. Two young found in a white pine tree were banded on May 20, 1929, with Nos. 220498 and 220499.

Brown Creeper. Two young from family of six about ready to leave nest. Banded June 13, 1929, with Nos. 46403B and 46404B.

Catbird. Two young from a nest seven feet up in a choke cherry tree near the lake shore were banded on June 27, 1928, with Nos. 251263

and 251264. Three young from a nest in a roadside lilac bush were banded on June 28, 1928, with Nos. 319136 to 319138 inclusive. Two young from another nest, able to fly but attended by parents, were banded on August 10, 1928, with Nos. 319003 and 319004. Five young from a nest in vine overhanging a creek were banded on June 28, 1929, with Nos. 522192 to 522196 inclusive.

Eastern Robin. Thirty-five robins were banded as follows: Nos. 251259 to 251261, young from nest in lake shore cottage, June 8, 1928; Nos. 319001, 319149 and 319150, young from nest in an abandoned house, July 26, 1928; No. 319002, young out of nest but attended by parent, June 28, 1928; Nos. 319011 to 319013, young from nest in an abandoned house, May 17, 1929; Nos. 319027 to 319029, young from nest in cow shed, August 2, 1929; No. 319030, young out of nest and able to fly a little, August 2, 1929; Nos. 319124 to 319127, young from martin house, May 23, 1928; No. 319131, young out of nest and able to fly a little, June 25, 1928; Nos. 319132 to 319135, young from nest in cow barn, June 28, 1928; Nos. 319142 to 319144, young from nest in roadside cherry sapling, June 29, 1928; No. 319148, young out of nest and able to fly a little, July 4, 1928; Nos. 552160 and 552161, young from nest in cottage near lake shore, May 19, 1928; Nos. 522162 and 522163, young from roadside apple tree, May 22, 1928; Nos. 522174 to 522177, young from cottage, June 8, 1928.

Eastern Hermit Thrush. Two young from nest of three about ready to fly, banded on June 28, 1928, with Nos. 319139 and 319140.

Veery. Two young from nest of three about ready to leave nest banded July 22, 1929, with Nos. 319025 and 319026.

Cedar Waxwing. Three young from nest thirty feet up in a willow tree on bank of Fish Creek. Banded on August 1, 1928, with Nos. 251275 to 251277.

Starling. Three young from nest six feet up in a dead limb of an old apple tree, near an abandoned farm house. Probably second brood. Banded June 24, 1929, with Nos. 319015 to 319017.

Yellow-throated Vireo. Four young from nest twenty feet up in shag-bark hickory. Banded July 30, 1928, with Nos. 46401B and 97998A to 98000A.

Black-throated Green Warbler. Four young from nest forty feet up in hemlock tree. Banded on June 20, 1928, with Nos. 97954A to 97957A.

Eastern Meadowlark. One young just out of nest and able to fly a little. Banded June 17, 1929 with No. 319014.

Eastern Red-winged Blackbird. Three young from nest in tuft of marsh grass banded on June 8, 1928 with Nos. 319128 to 319130. Nest containing three young banded June 29, 1928, with Nos. 319145 to 319147. One young (No. 522168) from family of three in a willow bog, able to fly a little, June

2, 1928. Two young from nest four feet up in an elderberry bush banded on June 21, 1928, with Nos. 522178 and 522179.

Bronzed Grackle. Four young from nest four feet up in willow tree overhanging water, May 28, 1928. Nos. 522164 to 522167.

Eastern Cowbird. One young (No. 251262) in nest with four young black-throated green warblers, June 20, 1928. Another cowbird (No. 319141) out of nest but not able to fly, attended by a pair of oven-birds, June 28, 1928. Also another young (No. 251270) in nest with three young song sparrows, two feet up in barberry bush, July 21, 1928.

Eastern Savannah Sparrow. One young bird (No. 46420) out of nest but attended by adults, August 7, 1929.

Eastern Chipping Sparrow. Four young about ready to leave nest on ground, banded on June 19, 1928, with Nos. 97950A to 97953A. Two young about ready to leave nest in wisteria vine at side of residence, banded on July 3, 1928, with Nos. 97981A and 97982A.

Eastern Song Sparrow. Four young from nest under brush pile, banded on June 30, 1928, with Nos. 97976A to 97979A. Four more young from a nest on ground under brush pile in a wooded tract were banded July 13, 1928, with Nos. 97980A and 97983A to 97985A. Three young from a nest two feet up in barberry bush at dwelling house were banded on July 21, 1928, with Nos. 97986A to 97988A. Four young from a nest on ground among dewberry vines, banded July 21, 1928, with Nos. 97989A to 97992A.

ANNOTATED SUPPLEMENTARY LIST OF THE LATE SPRING AND SUMMER BIRDS RECORDED FROM THE ONEIDA LAKE REGION

Obviously a set of field observations covering approximately a period of three and a half months during each of two successive seasons, making a total of seven months, is scarcely a sufficient basis for setting forth a list of birds as "complete" from any locality however limited in extent. This is particularly true of a territory as large and varied in topography and vegetation as the Oneida Lake region, and therefore no claim is made in these pages that the species of birds mentioned therein are the only ones that occur on or about the lake between May 1 and August 15. The fact that birds move easily from one place to another, that their relative abundance and distribution often fluctuate considerably from season to season and that it is not possible for an investigator to cover thoroughly all the productive bird habitats of so large a territory, in the limited time, suggests the likelihood not only of the occurrence of other species additional to those observed, but also of later modification of opinion regarding the local status of some of the species listed.

Recognizing this deficiency I am appending the following supplementary list of birds of the region. It contains the names of species which, so far as I can determine, have been observed by others in the territory I am calling the

"Oneida Lake region," but which I personally have not seen within the approximate dates May 1 and August 15. However, in both the matter of inclusive dates and locality detail, I have attempted to allow considerable latitude in order to make this list as comprehensive as possible; at the same time keeping in mind the fact that the present report deals only with the late spring and summer birds of this territory. Even so, the catalogue of birds of the region is not to be considered complete.

Upon consideration of the following list, it becomes apparent that a considerable number of species mentioned are rare or mere stragglers in this region. Moreover, marked changes in the avifauna have occurred here within the past thirty to forty years and it is hardly likely that some of the species listed as long ago as 1886 still retain their status of that day. But rather than attempt to construct a hypothetical list of species for the Oneida Lake region, I feel that one which supplements my own will prove more useful.

In compiling the present briefly annotated list of sixty-seven forms I have relied mainly upon the records of Ralph and Bagg (1886 and 1890), Bagg (1894, 1897, 1900 and 1912), Embury (1901), Barnum (1886) and Sadler (1926); but I have incorporated also authentic and pertinent records from other sources.

Red-throated Loon. *Gavia stellata* (Pontoppidan).

"[Accidental visitant; rare.—Beauchamp.]" (Barnum, 1886, p. 31.)

"One on exhibition at Sylvan Beach in 1891 was killed at Durhamville [about 5 miles southeast of Verona Beach] several years previously." (Bagg, 1894, p. 164.)

"Rare winter visitant." (Embury, 1901, p. 6.)

Holboell's Grebe. *Colymbus grisegena holboelli* (Reinhardt).

"Transient visitant; common." (Barnum, 1886, p. 31.)

Recorded by Bagg (1912, p. 24) as "A rare migrant" in Oneida County.

"Observed at Brewerton, Oneida Lake, near the outlet, as early as March 18 and at Onondaga Lake on April 14." (Sadler, 1926, p. 2.)

Black-capped Petrel. *Pterodroma hasitata* (Kuhl).

"A male of this rare straggler was shot at Verona Beach, on Oneida Lake, August 28, 1893, by the Rev. G. A. Biederman." (Bagg, 1894, p. 162.)

European Cormorant. *Phalacrocorax carbo carbo* (Linnaeus).

"One killed at Oneida Lake, was mounted by A. L. Brainard, of Oneida. The Rathbun-Fowler List, published at Auburn, records one killed at 'Upper South Bay,' Oneida Lake, by Mr. Edward H. Mann, of Syracuse, N. Y., which is mounted and preserved in the rooms of the Onondaga Sportsmen's Club of that city." (Ralph and Bagg, 1886, p. 125.)

"Accidental visitant; rare." (Barnum, 1886, p. 30.)

"I have had the pleasure of examining a fine specimen, killed on Oneida Lake, October 13, 1890." (Bagg, 1894, p. 163.)

Double-crested Cormorant. *Phalacrocorax auritus auritus* (Lesson).

"[Accidental visitant; rare. One shot at Nine-mile Point, Onondaga Lake, November 30, 1865, by J. H. Mann.—Rathbun.]" (Barnum, 1886, p. 30.)

Bagg (1912, pp. 28-29) writes as follows concerning this species: "Cormorants are often killed by gunners on Oneida Lake, most of which are undoubtedly of this species. I have several records and I have seen at least one myself, but could not secure him. I think the species might be put down as a 'Not common migrant.'"

"Two dead ones have been brought to Central High School. One was shot near Memphis. The second one was shot near Constantia." (Sadler, 1926, p. 3.)

Whistling Swan. *Cygnus columbianus* (Ord).

". . . Several swans, undoubtedly this species, have been killed on Oneida Lake." (Ralph and Bagg, 1886, p. 109.)

"Transient. Very rare. Three were on the Seneca River near Baldwinsville during the autumn of 1924. A farmer shot one not knowing what it was. The mounted specimen is in the Forestry College." (Sadler, 1926, p. 4.)

Black Brant. *Branta nigricans* (Lawrence).

"A fine specimen of this rare bird was killed by Mr. Augustus Dexter of Utica at Lewis Point, Madison County (on Oneida Lake), October 30, 1891." (Bagg, 1894, p. 163.)

Common Mallard. *Anas platyrhynchos platyrhynchos* Linnaeus.

"Seen at Onondaga Lake, Brewerton and Seneca River." (Sadler, 1926, p. 3.)

Dr. C. E. Johnson reports one individual on Oneida Lake at the mouth of Chittenango Creek on May 9, 1928, and two in a temporary pond in field near game protector's house, Chittenango Creek, April 5.

Gadwall. *Chaulelasmus streperus* (Linnaeus).

"Two killed April, 1884, and one October, 1885, at Oneida Lake, by Mr. A. A. Howlett, of Syracuse, and several killed at the same place by Mr. N. Wood of Brewerton." (Ralph and Bagg, 1886, p. 106.)

American Pintail. *Dafla acuta tzitzihua* (Vieillot).

"A common migrant." (Ralph and Bagg, 1886, p. 107.) "Arrives about September 20th." (Emboly, 1901, p. 8.)

"Transient visitant; common." (Barnum, 1886, p. 28.)

Green-winged Teal. *Nettion carolinense* (Gmelin).

"A common migrant." (Ralph and Bagg, 1886, p. 106.) "Very common autumn migrant. Arrives about September 1st, departs about October 20." (Emboly, 1901, p. 8.) "Transient visitant; common." (Barnum, 1886, p. 28.)

Sadler (1926, p. 4) records it as a "Transient" on Oneida Lake.

Mr. Will Shepard who lives near the Cicero Swamp south of Clay tells me that this duck sometimes nests here in the marsh.

Shoveller. *Spatula clypeata* (Linnaeus).

"One shot and another seen at Utica, April 19, 1884. Two killed September, 1879, at Oneida Lake, by Mr. A. A. Howlett." (Ralph and Bagg, 1886, p. 106.)

"Transient visitant; rare." (Barnum, 1886, p. 28.)

Redhead. *Nyroca americana* (Eyton).

"A migrant at Oneida Lake." (Ralph and Bagg, 1886, p. 107.) "Transient visitant; common." (Barnum, 1886, p. 29.) "A fairly common transient at Oneida Lake." (Embody, 1901, p. 9.)

Ring-necked Duck. *Nyroca collaris* (Donovan).

"Transient. Saw a male and two females on Onondaga Lake April 14, 1917." (Sadler, 1926, p. 4.)

Canvas-back. *Nyroca valisineria* (Wilson).

"A. L. Brainard, of Oneida, has mounted one specimen killed at the Lake." (Ralph and Bagg, 1886, p. 107.) "Transient visitant; tolerably common." (Barnum, 1886, p. 29.) "A transient visitant at Oneida Lake." (Embody, 1901, p. 9.)

Old-squaw. *Clangula hyemalis* (Linnaeus).

"A rare migrant. Gunners get a few at Oneida Lake every fall." (Bagg, 1912, p. 32.) "Transient visitant; abundant." (Barnum, 1886, p. 29.)

King Eider. *Somateria spectabilis* (Linnaeus).

"'A rare migrant. Several have been killed at Oneida Lake.' (Brainard.)" (Ralph and Bagg, 1886, p. 108.) "Accidental visitant. Oneida Lake, 20 Jan., 1877.—Howlett." (Barnum, 1886, p. 29.)

White-winged Scoter. *Melanitta deglandi* (Bonaparte).

"Two taken at Utica in the fall of 1881. Common at Oneida Lake." (Ralph and Bagg, 1886, p. 108.)

Surf Scoter. *Melanitta perspicillata* (Linnaeus).

"A specimen of this bird in the possession of Mr. A. L. Brainard, of Oneida, was killed at the lake in the fall of 1884." (Ralph and Bagg, 1886, p. 108.)

American Scoter. *Oidemia americana* Swainson.

"Occurs occasionally. 'Shot at Lyons Falls and in the Adirondacks.'—(Merriam)." (Ralph and Bagg, 1886, p. 108.) "Transient visitant; common on lakes." (Barnum, 1886, p. 29.) "Rare migrant. One taken in October, many years since, by Mr. Green Smith, at Peterboro, N. Y. . . . No recent record." (Embody, 1901, p. 9.)

Turkey Vulture. *Cathartes aura septentrionalis* Wied.

"A specimen of this bird was winged near Maynard, in this county [Oneida] in August, 1896. . . . Our second record." (Bagg, 1897, p. 227.)

Eastern Goshawk. *Astur atricapillus atricapillus* (Wilson).

"[Accidental visitant; rare.—Beauchamp.]" [Onondaga County.] (Bar-num, 1886, p. 21.)

"Very rare [Madison County]. One taken by Dr. H. S. Gardiner several years ago." (Embody, 1901, p. 15.)

"Not common except in the northern part of the county [Oneida] and in the West Canada Creek Valley where I see them every spring. . . ." (Bagg, 1912, p. 47.)

Mr. Will Shepard who lives near the Cicero Swamp south of Clay reports that he has shot and trapped several goshawks near the marsh, in the fall and winter.

American Rough-legged Hawk. *Buteo lagopus s. johannis* (Gmelin).

"Not uncommon spring and fall." (Ralph and Bagg, 1886, p. 118.)

On May 1, 1929, in the Short Point district, I saw what I thought was an individual of this species flying low over the swamp, but I was not satisfied with my determination of the bird and so have not included it in my own list.

Golden Eagle. *Aquila chrysaetos canadensis* (Linnaeus).

"A Golden Eagle was shot, wounded and captured at Clinton [Oneida County] early in May, 1896, and was kept in captivity for some time. Our second record." (Bagg, 1897, p. 227.)

Duck Hawk. *Falco peregrinus anatum* Bonaparte.

"A rare resident. Breeds" [in Oneida County]. (Bagg, 1912, p. 49.)

Eastern Pigeon Hawk. *Falco columbarius columbarius* Linnaeus.

"A specimen was taken at Sylvan Beach, Sept. 12, 1889, by Messrs. Shepard and James R. Benton." (Ralph and Bagg, 1890, p. 231.) "A transient visitant and rarely seen. But one male taken by the writer, (October 2nd, 1900), now in his collection." (Embody, 1901, p. 16.)

Eastern Bob-white. *Colinus virginianus virginianus* (Linnaeus).

Although I did not see this bird anywhere in the Oneida Lake region, Mr. E. H. Kingsbury, a resident of the Lower South Bay district, tells me that in August and September, 1926, "one individual" of this species occurred in that vicinity. Mr. Kingsbury is an old resident of the region, and this was the only record of the bob-white that he knew about for this territory. Mr. F. L. Becker, another resident, corroborated Mr. Kingsbury's statement.

Possibly this may have been one of the lot of bob-whites introduced into the region a number of years ago, for I understand that an effort was

made to establish—or re-establish—the species here as well as in other parts of the State. Apparently the attempt was unsuccessful.

“Has been killed in the county [Onondaga], but I have never seen or heard one here.” (Barnum, 1886, p. 23.)

Maxon (1903, p. 263) says of this species: “None recorded since 1893. Formerly a not uncommon summer resident.” Still occasional between Oneida and the Lake. A nest was taken at Peterboro [about 15 miles south of Oneida Lake] in the summer of 1894, the only time the bird has been known to occur in that vicinity.”

“A rare resident. Breeds. While probably native, our hard and changeable winters make it difficult for these birds to maintain themselves, and if not extinct in the county [Oneida] they were nearly so, when they were introduced and liberated in various places, Verona, New Hartford and Constantia, but the experiment has been of doubtful success, though there are records almost every year of their nesting in the western part of the county.” (Bagg, 1912, p. 43.)

“The Bob-white, or Quail, was formerly well distributed throughout New York State as far north as the counties of Jefferson, Oneida, Saratoga and Washington, to an altitude of about 1000 feet, and in the southeastern portion, to an altitude of 2000 feet. At the present day it is a rare bird in all portions of the State, excepting Long Island, the Lower Hudson valley and the Delaware valley. Numerous importations of southern or western birds have done little, if any, permanent good in restoring its former abundance. . . . The severity of our winters, and the depredations of cats and other predacious animals, and the persecution of gunners and pot hunters, combine to keep the birds continually in check.” (Eaton, 1910, pp. 361-362.)

The bob-white is a typical transition zone species, but in spite of its normal fecundity and hardness, its terrestrial and retiring habits and its tendency to withdraw from one district to another and perhaps more favorable one—a kind of local migration as it were—I suspect that the combination of circumstances, whatever be their nature, which prevail against it in the Oneida Lake region is too great and that it will not be able to maintain itself here in any numbers if at all.

Wilson's Plover. *Pagolla wilsonia wilsonia* (Ord).

“One shot near Upper South Bay, Oneida Lake, in 1880, by Mr. A. A. Howlett, of Syracuse.” (Ralph and Bagg, 1886, p. 115.)

American Golden Plover. *Pluvialis dominica dominica* (Müller).

“A common migrant at Oneida Lake.” (Ralph and Bagg, 1886, p. 115.)

“Transient visitant; common.” [Onondaga County]. (Barnum, 1886, p. 23.)

“A very uncertain migrant at Oneida Lake. Some years in fair numbers but more often very rare.” (Bagg, 1912, p. 42.)

Black-bellied Plover. *Squatarola squatarola* (Linnaeus).

“Three taken at Oneida Lake in September, 1879, by Mr. A. A. Howlett of Syracuse.” (Ralph and Bagg, 1886, p. 115.)

Ralph and Bagg (1890, p. 230) state that "A specimen was taken at Sylvan Beach, Oct. 8, 1888. Another was taken at the same place Sept. 24, 1889. These are the first records for the County [Oneida], though the species was given in the List as taken on the Lake by Mr. A. A. Howlett of Syracuse."

Bagg (1900, p. 178) gives as his second record for this species September 5 and 7, 1899. On this date his son and companions killed several birds at Verona Beach.

"A common migrant at Oneida Lake during some falls. Taken from September 1 to October 8. Very plentiful in 1907." (Bagg, 1912, p. 42.)

Dr. C. E. Johnson records two black-bellied plovers at the Sylvan Beach breakwater on September 9, 1927; a juvenile specimen August 21, 1929; and two juveniles, September 4, 1930.

Long-billed Curlew. *Numenius americanus americanus* Bechstein.

"Mr. A. A. Howlett, of Syracuse, reports that October 5th, 1880, at Oneida Lake, a flock passed near enough to give him a shot, and though he did not secure any, he is positive of their identification, being familiar with them and with the other curlews." (Ralph and Bagg, 1886, p. 115.)

Hudsonian Curlew. *Phaeopus hudsonicus* (Latham).

"Transient visitant; common." [Onondaga County.] (Barnum, 1886, p. 26.)

"A specimen of this bird, sex unknown, was shot on Verona Beach, Oneida Lake, by Egbert Bagg, Jr., Sept. 5, 1899." (Bagg, 1900, p. 177.)

American Knot. *Calidris canutus rufus* (Wilson).

"A young bird was taken at Lewis Point, Oneida Lake, in Madison County, August 26, 1891." (Bagg, 1894, p. 163.) Another specimen is recorded by Bagg (1912, p. 39) as having been taken on Fish Creek about two miles from Oneida Lake, on September 4, 1906.

White-rumped Sandpiper. *Pisobia fuscicollis* (Vieillot).

"Accidental visitant; rare [Onondaga County]. (Barnum, 1886, p. 24).

"Several killed on the south shore of Oneida Lake, Nov. 3, 1891." (Bagg, 1894, p. 163).

Baird's Sandpiper. *Pisobia bairdi* (Coues).

"A young bird was shot at Verona Beach by Egbert Bagg, Jr., September 4, 1897, and a second specimen at the same place, September 5, 1899. Our only previous knowledge was Mr. Henshaw's record at Locust Grove in 'The Auk' Vol. II, page 384." (Bagg, 1900, p. 178.)

Red-backed Sandpiper. *Pelidna alpina sakhalina* (Vieillot).

"Several [were taken] at Oneida Lake, October 5, 1881." (Ralph and Bagg, 1886, p. 113.)

Eastern Dowitcher. *Limnodromus griseus griseus* (Gmelin).

"Two birds of this species were shot near the eastern end of Oneida Lake, September 22, 1883, by Mr. Morgan K. Barnum of Syracuse. The same day he is confident he saw a flock of this snipe, containing as well as he could judge, about fifteen. The two killed were single birds. Two shot at Oneida Lake, in 1880, by Mr. A. A. Howlett, of Syracuse." (Ralph and Bagg, 1886, pp. 112-113.)

"Transient visitant; common." [Onondaga County]. (Barnum, 1886, p. 24.)

Stilt Sandpiper. *Micropalama himantopus* (Bonaparte).

Two individuals recorded by Sadler (1926, p. 7) at Onondaga Lake, July 28, 1919.

Marbled Godwit. *Limosa fedoa* (Linnaeus).

"[One shot by F. A. Howlett in June, 1876.—Rathbun.]" (Barnum, 1886, p. 25.)

Hudsonian Godwit. *Limosa haemastica* (Linnaeus).

"Accidental visitant; rare. Onondaga Lake, October 13, 1883." (Barnum, 1886, p. 25.)

"A specimen was killed about a mile west of Lewis Point, September 7, 1891, and another near the same place a few weeks later." (Bagg, 1894, p. 163.)

Red Phalarope. *Phalaropus fulicarius* (Linnaeus).

"An uncommon migrant at Oneida Lake." (Bagg, 1912, p. 37.)

Wilson's Phalarope. *Steganopus tricolor* Vieillot.

"A specimen of this bird was shot near the eastern end of Oneida Lake, October 6, 1883, by Mr. Morgan K. Barnum, of Syracuse. When first observed the bird was swimming upon the surface of the Lake." (Ralph and Bagg, 1886, p. 112.)

"Accidental visitant; rare, Oneida Lake, October 6, 1883." (Barnum, 1886, p. 23.)

Northern Phalarope. *Lobipes lobatus* (Linnaeus).

"[Accidental visitant; rare; has been killed at Baldwinsville.—Beauchamp.]" (Barnum, 1886, p. 24.)

"A rare migrant. One taken at Oneida Lake September 21, 1889." (Bagg, 1912, p. 37.)

Also recorded at Onondaga Lake on September 14, 1918, July 26, 1920, and September 4, 1924, by Sadler (1926, p. 6.)

Atlantic Kittiwake. *Rissa tridactyla tridactyla* (Linnaeus).

"A young male of this species was killed at Constantia, Oswego Co. (on Oneida Lake), November 9, 1890, by Robert J. Hughes." (Bagg, 1894, p. 162.)

Passenger Pigeon. *Ectopistes migratorius* (Linnaeus).

"Transient visitant; tolerably common." [Onondaga County]. (Barnum, 1886, p. 22.)

"A common migrant [in Oneida County] until within a few years, but is now less common than formerly." (Ralph and Bagg, 1886, p. 116.)

"A great change has taken place since then. [1886]. Undoubtedly it had taken place at that time, although I had no idea of it, nor had any other observer. This bird was then far on its way to extinction which extinction is now complete." (Bagg, 1912, p. 44.)

Yellow-billed Cuckoo. *Coccyzus americanus americanus* (Linnaeus).

Although throughout our field work in the Oneida Lake region we made special effort to discover the yellow-billed cuckoo, all the individuals that we saw were black-bills. And, as I have indicated under the discussion of that species, while I can not with certainty identify the "song" of the two birds, it is possible that we may have heard the yellow-bill without recognizing it. The fact remains, however, that the yellow-bill at the present time must be much less common in the region than the black-bill, or we should have seen it.

All the earlier records list the yellow-billed cuckoo as a summer resident in each of the four counties surrounding Oneida Lake, nevertheless it may be that, as in Massachusetts, the numbers of this bird—which is normally of a more southerly distribution—have fallen off somewhat in recent years. In this connection Forbush (1927, p. 246) says: "In the latter part of the last century the 'Yellow-bill' was regarded as the most abundant of the two in southern New England, but more recently there seems to have been a change in this respect."

Eaton (1910, sec. 3) tabulates the following information regarding this species in the four counties bordering Oneida Lake.

Oswego County. Common summer resident. Arrives from the South May 2. Breeding, June 2.

Oneida County. Common summer resident. Arrives from the South May 9 to 17. Breeds.

Onondaga County. Common summer resident. Breeding June 10.

Madison County. Fairly common. Arrives from the South May 12. Breeds. Departs for South September 18.

Sadler (1926, p. 9) lists the yellow-billed cuckoo as a "summer resident" in the vicinity of Syracuse and records a nest with young at Cazenovia Lake, July 12, 1923.

From the available evidence, therefore, it would seem that despite my failure throughout two seasons to record a single specimen of the yellow-billed cuckoo in the region, its presence, nevertheless, may be expected.

In habits the yellow-billed and black-billed cuckoos are similar, although the former is more given to visiting the larger trees and orchards in the vicinity of human habitations than is the latter.

The two species are similar in appearance, but in the yellow-bill most of the wing feathers are rufous, the outer tail feathers black conspicuously tipped with white; and the lower mandible yellow except at the tip.

Barn Owl. *Tyto alba pratincola* (Bonaparte).

Recorded from Marcy, in Oneida County, some twenty miles east of Sylvan Beach, "about the middle of September, 1898," by Bagg. (1900, p. 177.)

Northern Barred Owl. *Strix varia varia* Barton.

"A not uncommon resident." [Oneida County] (Ralph and Bagg, 1886, p. 119.) "Not uncommon during the winter months." (Embody, 1901, p. 16.)

"Permanent resident; common; breeds." [Onondaga County]. (Barnum, 1886, p. 20.)

Long-eared Owl. *Asio wilsonianus* (Lesson).

"A common resident. Breeds." [Oneida County]. (Ralph and Bagg, 1886, p. 119.) "More abundant in winter." (Embody, 1901, p. 16.)

"Permanent resident; common; breeds." [Onondaga County]. (Barnum, 1886, p. 19.)

Short-eared Owl. *Asio flammeus flammeus* (Pontoppidan).

"Fairly common resident. Breeds." [Madison County]. (Embody, 1901, p. 16.)

"Permanent resident; common; breeds." [Onondaga County]. (Barnum, 1886, p. 19.)

Red-Bellied Woodpecker. *Centurus carolinus* (Linnaeus).

"'A rare straggler.'—(Merriam.)" [Oneida County]. (Ralph and Bagg, 1886, p. 124.)

"Of rare and irregular occurrence. One recorded March 8, 1898." [Madison County]. (Embody, 1901, p. 19.)

Acadian Flycatcher. *Empidonax vireescens* (Vieillot).

I have not seen the Acadian or green-crested flycatcher in the Oneida Lake region. In general, the bird is common only in the southeastern part of the State, where it breeds. It is uncommon and of more or less local occurrence elsewhere. Eaton (1914, p. 195) records the species from several places in the interior of the State, among them Syracuse, May 29, 1887. On authority of A. W. Perrior he reports it as a breeding species in Onondaga County. Sadler (1926, p. 11) says: "Seen in Oakwood Cemetery. Thornden and near Brewerton." The last named locality is in the Oneida Lake region as here understood.

This flycatcher seems to prefer woodland of deciduous trees growing on the drier uplands. No doubt the bird is overlooked frequently in the field for, in appearance it closely resembles the alder and to some extent the least flycatcher. Possibly this bird may prove to be commoner in the Oneida Lake region than present evidence indicates.

Blue-gray Gnatcatcher. *Polioptila caerulea caerulea* (Linnaeus).

In Onondaga County, Barnum, (1886, p. 4) lists it as "[Accidental visitant; rare.—*Beauchamp*.]"

Eastern Golden-crowned Kinglet. *Regulus satrapa satrapa* Lichtenstein.

Barnum (1886, p. 4) records the golden-crowned kinglet as an abundant transient visitant in Onondaga County.

Ralph and Bagg (1890, p. 232) list it as "An occasional resident both winter and summer; breeds. [Oneida County.]

". . . During the latter part of June, 1888, near Holland Patent [about 25 miles east of Sylvan Beach] we observed a pair of these birds followed by seven or eight young which they were feeding."

Emboly (1901, p. 33) says: "An abundant transient visitant [in Madison County]. Occasionally found in winter. Arrives about April 10. Departs about May 7."

White-eyed Vireo. *Vireo griseus griseus* (Boddaert).

"Transient visitant; tolerably common." [Onondaga County.] (Barnum, 1886, p. 11.)

"Two seen and heard singing at Constantia on May 26, 1917." (Sadler, 1926, p. 17.)

Plumbeous Vireo. *Vireo solitarius plumbeus* Coues.

A female recorded by Gerrit S. Miller, Jr., from Peterboro, Madison County, in "The Auk" (Vol. 11, 1894, p. 79). Peterboro is about fourteen miles south of Oneida Lake. The specimen was taken on September 24, 1893. This far western form is certainly of only accidental occurrence in New York State.

Philadelphia Vireo. *Vireo philadelphicus* (Cassin).

"One taken September 14th, 1880, and others seen at the same time." (Ralph and Bagg, 1886, p. 136.)

For Madison County, Emboly (1901, p. 28) says: "Seen occasionally during migrations. Observed May 7, 1898, May 4, 1900, Sept. 16, 1900."

Orange-crowned Warbler. *Vermivora celata celata* (Say).

"Rare. One taken September 16th, 1880." [Oneida County.] (Ralph and Bagg, 1886, p. 137.)

Emboly (1901, p. 29) reports for Madison County: "Rare transient visitant. One male taken May 15, 1899."

Northern Pine Warbler. *Dendroica pinus pinus* (Wilson).

"Transient visitant; tolerably common." [Onondaga County.] (Barnum, 1886, p. 8.)

Concerning the summer status of this bird, Ralph and Bagg, (1890, p. 232) remark: "June 11, 1899 at Sylvan Beach, we saw at least two pairs building

in high pines. . . . About two weeks later a single bird was seen in the same place. . . . It must now be given as a rare summer resident, breeding."

The locality above mentioned is the one in the region where the pine warbler is most likely to be found, and I was disappointed in not being able to add it to my own list.

Connecticut Warbler. *Oporornis agilis* (Wilson).

"One taken September 18th, 1880, and one September 8th, 1881. (Ralph and Bagg, 1886, p. 141.)

Yellow-breasted Chat. *Icteria virens virens* (Linnaeus).

Maxon (1903, p. 266) reports a specimen taken by Gerrit S. Miller at Peterboro, but gives no date.

Orchard Oriole. *Icterus spurius* (Linnaeus).

Emboly (1901, p. 22) says: "Of rare occurrence in Madison county. Two birds (male and female) were taken by the writer May 26th, 1899, and are now in the writer's collection."

Sadler (1926, p. 13) says: "Rare. Have not seen one since 1912, when an immature male of the second year was seen on the Behm farm at Manlius on June 1, 1912." Manlius is about ten miles south of Bridgeport.

Rusty Blackbird. *Euphagus carolinus* (Müller).

"Several taken in the County." [Oneida.] (Ralph and Bagg, 1886, p. 128.) Abundant during fall migrations." (Emboly, 1901, p. 22.)

"Transient visitant; common." [Onondaga County.] (Barnum, 1886, p. 16.)

Eastern Cardinal. *Richmondia cardinalis cardinalis* (Linnaeus).

"Accidental visitant; rare. [One shot by Mr. C. H. Chapin in a Tamarack swamp, near Syracuse, May 9, 1884.—*Northrup*.]" (Barnum, 1886, p. 15.)

In May, 1928, Dr. C. E. Johnson and Mr. W. A. Dence saw a single male at the Morningside Cemetery in Syracuse, and in May of the following year Dr. Johnson saw one individual in Oakwood Cemetery. Mr. Dence also tells me that a cardinal wintered in the vicinity of Walnut Park and that it frequently visited feeding stations in the University section of Syracuse. Apparently this bird has not yet become thoroughly established in this section of the State.

Acadian Sparrow. *Ammospiza caudacuta subvirgata* (Dwight).

"A rare transient visitant. One male closely approaching this variety, taken October 8, 1898, now in writer's collection." (Emboly, 1901, p. 24.)

"Mr. Emboly reports that he sent two of the Sharp-tailed Sparrows taken by him, October 8, 1898, to Mr. Frank M. Chapman for identification and that he assigned one of them to the 'Acadian.'" (Bagg, 1912, p. 64.)

Nelson's Sparrow. *Ammospiza caudacuta nelsoni* (Allen).

"A specimen of this rare sparrow was shot near Utica, October 12th, 1883. (Ralph and Bagg, 1886, p. 131.)

"A rare transient visitant. Four birds were seen in a marsh just outside Hamilton [Madison County], October 8, 1898, two of which were in song. One male captured, now in the writer's collection. Another bird collected in the same marsh, October 17, 1900, now in the writer's collection." (Embody, 1901, p. 24.)

Lincoln's Sparrow. *Melospiza lincolni lincolni* (Audubon).

Maxon (1903, p. 265) says: "Mentioned by Mr. Embody only in his hypothetical list. Mr. Miller reports having taken a specimen at Peterboro during spring migration." Peterboro is about fourteen miles south of Oneida Lake, in Madison County.

Recorded as "Rare" by Sadler (1926, p. 15) in the Syracuse district.

LIST OF REFERENCES

This list is in no sense a complete bibliography of the birds of the Oneida Lake region. Only the titles cited in this report and the more important works consulted in its preparation are included here.

Adams, C. C.

1923. Notes on the Relation of Birds to Adirondack Forest Vegetation. Roosevelt Wild Life Bull., Vol. 1, No. 4, pp. 487-519.

Adams, C. C., and Hankinson, T. L.

1928. The Ecology and Economics of Oneida Lake Fish. Roosevelt Wild Life Annals, Vol. 1, Nos. 3 and 4, pp. 1-548.

Allen, Arthur A.

1915. The Behavior of the Least Bittern. Bird-Lore, Vol. 17, No. 6, pp. 425-430.
1924. A Contribution to the Life History and Economic Status of the Screech Owl (*Otus asio*). The Auk, Vol. 41, No. 1, pp. 1-16.

Allen, Glover M.

1925. Birds and their Attributes. Pp. 1-338. Marshall Jones Co., Boston.

American Ornithologists' Union

1910. Check-List of North American Birds. Third Edition (Revised). Pp. 1-430. New York.
1912. Sixteenth Supplement to the American Ornithologists' Union's Check-List of North American Birds. The Auk, Vol. 29, No. 3, pp. 380-387.
1920. Seventeenth Supplement to the American Ornithologists' Union's Check-List of North American Birds. The Auk, Vol. 37, No. 3, pp. 439-449.
1923. Eighteenth Supplement to the American Ornithologists' Union's Check-List of North American Birds. The Auk, Vol. 40, No. 3, pp. 513-525.
1931. Check-List of North American Birds. Fourth Edition. Pp. 1-526. Lancaster, Pa.

Bagg, Egbert

1894. Birds of Oneida County, New York. The Auk, Vol. 11, No. 2, pp. 162-164.
1897. Some new Records from Central New York. The Auk, Vol. 14, No. 2, pp. 226-227.
1900. Birds from Central New York. The Auk, Vol. 17, No. 2, pp. 177-178.
1912. Annotated List of the Birds of Oneida County, New York. Trans. Oneida Hist. Soc., Vol. 12, pp. 16-85.

Baker, F. C.

1916. The Relation of Mollusks to Fish in Oneida Lake. N. Y. State Coll. of Forestry, Tech. Pub. No. 4, pp. 1-366.

Barnum, Morgan K.

1886. A List of the Birds of Onondaga County. Pp. 1-34. Syracuse Univ., Syracuse, N. Y.

Barrows, Walter B.

1912. Michigan Bird Life. Special Bulletin, Dept. Zool. and Physiol., Mich. Agric. College, East Lansing, Mich. Pp. 1-822.

Beal, F. E. L.

1897. Some Common Birds in their Relation to Agriculture. U. S. Dept. Agric., Farmers' Bull. 54, pp. 1-40.
1911. Food of the Woodpeckers of the United States. U. S. Dept. Agric., Biol. Surv. Bull. 37, pp. 1-64.

1912. Food of our more Important Flycatchers. U. S. Dept. Agric., Biol. Surv. Bull. 44, pp. 1-67.
1915. Food Habits of the Thrushes of the United States. U. S. Dept. Agric., Biol. Surv., Professional Paper 280, pp. 1-23.
1918. Food Habits of the Swallows. U. S. Dept. Agric., Biol. Surv. Professional Paper 619, pp. 1-28.
- Beal, F. E. L., and McAtee, W. L.
1912. Food of Some Well-known Birds of Forest, Farm, and Garden. U. S. Dept. Agric., Farmers' Bull. 506, pp. 1-35.
- Bent, Arthur C.
1921. Life Histories of North American Gulls and Terns. Order Longipennes. U. S. Nat. Museum Bull. 113, pp. 1-345.
1923. Life Histories of North American Wild Fowl. Order Anseres. (Part). U. S. Nat. Museum Bull. 126, pp. 1-250.
1925. Life Histories of North American Wild Fowl. Order Anseres. (Part). U. S. Nat. Museum Bull. 130, pp. 1-376.
1926. Life Histories of North American Marsh Birds. Orders Odontoglossae, Herodiones and Paludicolae. U. S. Nat. Museum Bull. 135, pp. 1-490.
1927. Life Histories of North American Shore Birds. Order Limicolae (Part 1). U. S. Nat. Museum Bull. 142, pp. 1-420.
1929. Life Histories of North American Shore Birds. Order Limicolae (Part 2). U. S. Nat. Museum Bull. 146, pp. 1-412.
- Bourne, Thomas L.
1921. An Egret (*Herodias egretta*) Record from Oswego County, N. Y. The Auk, Vol. 38, No. 2, p. 273.
- Bray, W. L.
1915. The Development of the Vegetation of New York State. N. Y. State Coll. of Forestry, Tech. Pub. 3, pp. 1-186. (Second Edition, Tech. Pub. 29, 1930, pp. 1-189.)
- Brewster, William
1902. Voices of a New England Marsh. Bird-Lore, Vol. 4, No. 2, pp. 43-56.
- Brown, H. P.
1921. Trees of New York State: Native and Naturalized. N. Y. State Coll. of Forestry, Tech. Pub. 15, pp. 1-433.
- Burns, Frank L.
1915. Comparative Periods of Deposition and Incubation of Some North American Birds. Wilson Bull., Vol. 27, No. 1, pp. 275-286.
- Chapin, Edward A.
1925. Food Habits of the Vireos. U. S. Dept. Agric., Dept. Bull. 1355, pp. 1-42.
- Chapman, Frank M.
1914. Handbook of Birds of Eastern North America. Pp. 1-530. D. Appleton and Co., N. Y.
- Cooke, May Thacher
1928. The Spread of the European Starling in North America. U. S. Dept. Agric., Cir. 40, pp. 1-9.
1929. Birds of the Washington, D. C. Region. Proc. Biol. Soc., Wash., Vol. 42, pp. 1-80.
- Cooke, Wells W.
1915. Distribution and Migration of North American Gulls and their Allies. U. S. Dept. Agric., Biol. Surv. Bull. 292, pp. 1-70.

- Dearborn, Ned
1917. The English Sparrow as a Pest. U. S. Dept. Agric., Farmers' Bull. 493, pp. 1-22.
- DeKay, James E.
1844. Zoology of New York or the New York Fauna, etc. Part II. Birds. Pp. 1-380, and Pls. 1-141. State Museum, Albany.
- Earnshaw, Frank L., and Grimes, Frank G.
1929. Game Laws for the Season 1929-1930. U. S. Dept. Agric., Farmers' Bull. 1616 pp. 1-46.
- Eaton, Elon H.
1910. Birds of New York. New York State Museum, Memoir 12, Part 1. Introductory Chapters: Water Birds and Game Birds. Pp. 1-501.
1914. Birds of New York. New York State Museum, Memoir 12, Part 2. General Chapters: Land Birds. Pp. 1-719.
- Embury, George C.
1901. Birds of Madison County, New York. Bull. Dept. Geol. and Nat. Hist., Colgate Univ., pp. 1-36. Hamilton, N. Y.
- Ewing, H. E.
1911. The English Sparrow as an Agent in the Dissemination of Chicken and Bird Mites. The Auk, Vol. 28, No. 3, pp. 335-340.
- Fisher, A. K.
1893. Hawks and Owls of the United States in their Relation to Agriculture. U. S. Dept. Agric., Div. Ornith. and Mammalogy, Bull. 3, pp. 1-210.
- Forbes, S. A.
1882. The Regulative Action of Birds upon Insect Oscillations. Bull. Ill. State Lab. Nat. Hist., Vol. 1, No. 6, pp. 1-32.
- Forbush, Edward H.
1913. Useful Birds and their Protection. Mass. State Board Agric., pp. 1-451. (Fourth Edition.)
1916. The Natural Enemies of Birds. Mass. State Board Agric., Economic Biology. Bull. 3, pp. 1-58.
1925. Birds of Massachusetts and other New England States. Part 1, Water Birds, Marsh Birds and Shore Birds. Mass. State Board Agric., pp. 1-481.
1927. Birds of Massachusetts and other New England States. Part 2, Land Birds from Bob-whites to Grackles. Mass. State Board Agric., pp. 1-461.
1929. Birds of Massachusetts and other New England States. Part 3, Land Birds from Sparrows to Thrushes. Introduction and Biographical Sketch of Edward Howe Forbush, pp. i-xlvi and text, pp. 1-466.
- Friedmann, Herbert
1929. The Cowbirds. A Study in the Biology of Social parasitism. Pp. 1-421. Charles C. Thomas, Springfield, Ill., and Baltimore, Md.
- Gabrielson, Ira N.
1924. Food Habits of Some Winter Bird Visitants. U. S. Dept. Agric., Dept. Bull. 1249, pp. 1-32.
- Grinnell, Joseph; Bryant, Harold C., and Storer, Tracy I.
1918. The Game Birds of California. Contrib. from the Univ. of Calif. Museum of Vert. Zool. Pp. 1-642. Berkeley.

Gross, Alfred O.

1923. The Black-Crowned Night Heron (*Nycticorax nycticorax naevius*) of Sandy Neck. The Auk, Vol. 40, pp. 1-30; 191-214.

Herrick, Francis H.

1924. An Eagle Observatory. The Auk, Vol. 41, No. 1, pp. 89-105.
1924a. Nests and Nesting Habits of the American Eagle. The Auk, Vol. 41, No. 2, pp. 213-231.
1924b. The Daily Life of the American Eagle: Late Phase. The Auk, Vol. 41, No. 3, pp. 389-422; No. 4, pp. 517-541.

Hopkins, Thomas C.

1914. The Geology of the Syracuse Quadrangle. N. Y. State Museum Bull. 171, pp. 1-80. Albany, N. Y.

House, Homer D.

1918. The Vegetation of the Eastern End of Oneida Lake. N. Y. State Museum Bull. 197, pp. 61-110. Albany N. Y.

Howell, Arthur H.

1928. Birds of Alabama. Dept. Game and Fisheries of Alabama. Pp. 1-384. Birmingham. (Second edition.)

Jones, Lynds

1906. A Contribution to the Life History of the Common and Roseate Terns. The Wilson Bull., Vol. 18, No. 2, pp. 35-47.

Kalmbach, E. R.

1918. The Crow and its Relation to Man. U. S. Dept. Agric., Biol. Surv. Bull. 621, pp. 1-92.
1920. The Crow in its Relation to Agriculture. U. S. Dept. Agric., Farmers' Bull. 1102, pp. 1-20.
1928. The European Starling in the United States. U. S. Dept. Agric., Farmers' Bull. 1571, pp. 1-27.

Kalmbach, E. R., and Gabrielson, I. N.

1921. Economic Value of the Starling in the United States. U. S. Dept. Agric., Biol. Surv. Bull. 868, pp. 1-66.

Kalmbach, E. R., and McAtee, W. L.

1925. Homes for Birds. U. S. Dept. Agric., Farmers' Bull. 1456, pp. 1-21.
1930. English Sparrow Control. U. S. Dept. Agric., Leaflet 61, pp. 1-8.

Keeler, Harriet L.

1903. Our Northern Shrubs and How to Identify Them. Pp. 1-521. Charles Scribner's Sons, N. Y.

Leffingwell, Dana J.

1925. Mockingbird in Central New York. The Auk, Vol. 42, No. 1, pp. 140-141.

Lincoln, Frederick C.

1924. Returns from Banded Birds, 1920 to 1923. U. S. Dept. Agric., Dept. Bull. 1268, pp. 1-56.

Maxon, William R.

1903. Notes on the Birds of Madison County, New York, with Especial Reference to Embury's Recent List. The Auk, Vol. 20, No. 3, pp. 262-266.

McAtee, W. L.

1917. Propagation of Wild-Duck Foods. U. S. Dept. Agric., Bull. 465, pp. 1-40.

1918. Food Habits of the Mallard Ducks of the United States. U. S. Dept. Agric., Biol. Surv. Bull. 720, pp. 1-36.
 1920. Farm Help from the Birds. U. S. Dept. Agric., Yearbook Separate 843, pp. 253-270.
 1922. Community Bird Refuges. U. S. Dept. Agric., Farmers' Bull. 1239, pp. 1-16.
 - 1922a. How to Attract Birds in the East Central States. U. S. Dept. Agric., Farmers' Bull. 912, pp. 1-16.
 1926. The Relation of Birds to Woodlots in New York State. Roosevelt Wild Life Bull., Vol. 4, No. 1, pp. 2-152.
- McAtee, W. L., and Beal, F. E. L.
1912. Some Common Game, Aquatic and Rapacious Birds in Relation to Man. U. S. Dept. Agric., Farmers' Bull. 497, pp. 1-30.
- Merriam, C. Hart
1898. Life Zones and Crop Zones of the United States. U. S. Dept. Agric., Div. Biol. Surv., Bull. 10, pp. 1-79.
- Nice, Margaret M.
1922. A Study of the Nesting of Mourning Doves. The Auk, Vol. 39, No. 4, pp. 457-474.
 1923. A Study of the Nesting of Mourning Doves [concluded]. The Auk, Vol. 40, No. 1, pp. 37-58.
- Oberholser, Harry C.
1906. The North American Eagles and their Economic Relations. U. S. Dept. Agric., Biol. Surv. Bull. 27, pp. 1-31.
- Pernie, Miles D.
1921. Jaeger at Sandy Pond, Oswego County, N. Y. The Auk, Vol. 38, No. 3, pp. 597.
- Phillips, Charles L.
1887. Egg-laying Extraordinary in *Colaptes auratus*. The Auk, Vol. 4, No. 4, p. 346.
- Phillips, J. C.
1911. Ten Years of Observation on the Migration of Anatidæ at Wenham Lake, Massachusetts. The Auk, Vol. 28, No. 2, pp. 188-200.
- Ralph, William L., and Bagg, Egbert
1886. An Annotated List of the Birds of Oneida County, N. Y., and its Immediate Vicinity. Trans. Oneida Hist. Soc., Vol. 3, pp. 101-147.
 1890. Additional Notes on the Birds of Oneida County, New York. The Auk, Vol. 7, No. 3, pp. 229-232.
- Sadler, Nettie M.
1926. Birds of Syracuse and Vicinity. Pp. 1-20. William Nottingham Junior-Senior High School Print, Syracuse, N. Y.
- Saunders, Aretas A.
1911. A Study of the Nesting of the Cedar Waxwing. The Auk, Vol. 28, No. 3, pp. 323-329.
 1923. The Summer Birds of the Allegany State Park. Roosevelt Wild Life Bull., Vol. 1, No. 3, pp. 239-354.
 1926. The Summer Birds of Central New York Marshes. Roosevelt Wild Life Bull., Vol. 3, No. 3, pp. 335-476.
 - 1926a. Additional Notes on the Summer Birds of Allegany State Park. Roosevelt Wild Life Bull., Vol. 3, No. 3, pp. 477-497.
 1929. The Summer Birds of the Northern Adirondack Mountains. Roosevelt Wild Life Bull., Vol. 5, No. 3, pp. 327-499.

- 1929a. Bird Song. New York State Museum Handbook 7. Pp. 1-202. Albany, N. Y.
- Sawyer, Edmund J.
1923. The Ruffed Grouse with Special Reference to its Drumming. Roosevelt Wild Life Bull., Vol. 1, No. 3, pp. 355-384.
- Sherman, Althea R.
1913. The Nest Life of the Sparrow Hawk. The Auk, Vol. 30, No. 3, pp. 406-418.
- Silloway, Percy M.
1920. Guide to the Summer Birds of the Bear Mountain and Harriman Park Sections of the Palisades Interstate Park. N. Y. State Coll. of Forestry, Bull. 11, pp. 1-105.
1923. Relation of Summer Birds to the Western Adirondack Forest. Roosevelt Wild Life Bull., Vol. 1, No. 4, pp. 397-486.
- State of New York
1929. The Conservation Law in Relation to Fish and Game. Pp. 1-220. Albany, N. Y.
1929a. Conservation Department. Eighteenth Annual Report for the year 1928. Pp. 1-424. Albany, N. Y.
- Stoner, Dayton
1920. Nesting Habits of the Hermit Thrush in Northern Michigan. Univ. Iowa Studies in Nat. Hist., Vol. 9, No. 2, pp. 1-21.
1920a. Whip-poor-will Calls. The Wilson Bull., Vol. 32, No. 3, pp. 87-93.
1925. Observations and Banding Notes on the Bank Swallow. The Auk, Vol. 42, No. 1, pp. 86-94.
1925a. The Toll of the Automobile. Science, Vol. 61, No. 1568, pp. 56-57.
1926. Observations and Banding Notes on the Bank Swallow, II. The Auk, Vol. 43, No. 2, pp. 198-213.
1926a. Temperature Studies on the Bank Swallow. Anat. Record, Vol. 34, No. 3, p. 32.
1928. Observations and Banding Notes on the Bank Swallow, III. The Auk, Vol. 45, No. 1, pp. 41-45.
1928a. Observations and Banding Notes on the Bank Swallow, IV. The Auk, Vol. 45, No. 3, pp. 310-320.
- Strong, R. M.
1912. Some Observations on the Life-History of the Red-breasted Merganser, *Mergus serrator* Linn. The Auk, Vol. 29, No. 4, pp. 479-488.
- Sutton, George M.
1928. An Introduction to the Birds of Pennsylvania. Pp. 1-169. J. Horace McFarland Co., Harrisburg, Pa.
1929. How can the Bird-lover help to save the Hawks and Owls? The Auk, Vol. 46, No. 2, pp. 190-195.
- Taber, William B., Jr.
1930. The Fall Migration of Mourning Doves. The Wilson Bull., Vol. 42, No. 1, pp. 17-28.
- Tuttle, H. E.
1919. Some Notes on the Drumming of the Ruffed Grouse. The Auk, Vol. 36, pp. 325-339.
- Warren, B. H.
1890. Report on the Birds of Pennsylvania. Second Edition Revised and Augmented. Pp. 1-434. Harrisburg, Pa.

Wetmore, Alexander

- 1924. Food and Economic Relations of North American Grebes. U. S. Dept. Agric., Dept. Bull. 1196, pp. 1-23.
- 1927. Our Migrant Shorebirds in Southern South America. U. S. Dept. Agric., Tech. Bull. 26, pp. 1-24.
- 1929. A Systematic Classification for the Birds of the World. Proc. U. S. Nat. Mus., Vol. 76, Art. 24, pp. 1-8.

Wetmore, A., and Miller, W. deW.

- 1926. The Revised Classification for the Fourth Edition of the A. O. U. Check-List. The Auk, Vol. 43, No. 3, pp. 337-346.

INDEX

A

Accipiter cooperi, 416
Accipiter velox velox, 416
Actitis macularia, 465
Agelaius phoeniceus phoeniceus, 684
Aix sponsa, 402
Ammodramus savannarum australis, 714
Ammospiza caudacuta nelsoni, 752
Ammospiza caudacuta subvirgata, 751
Anas platyrhynchos platyrhynchos, 742
Anas rubripes tristis, 394
Anthus spinoletta rubescens, 607
Antrostomus vociferus vociferus, 503
Aquila chrysaetos canadensis, 744
Archilochus colubris, 509
Ardea herodias herodias, 368
Arenaria interpres morinella, 459
Asio flammeus flammeus, 749
Asio wilsonianus, 749
Astur atricapillus atricapillus, 744

B

Baker Point district, 320
 Baldpate, 400
Bartramia longicauda, 464
 Bernhard Bay, 361
 Bernhard Bay, village, 318
 Big Bay Creek, 322
 Big Bay district, 322
 Billington Bay district, 304
 Bittern,
 American, 384
 Eastern Least, 388
 Blackbird, Rusty, 751
 Black Creek, 305
 Bluebird, Eastern, 604
 Bobolink, 679
 Bob-white, Eastern, 744
Bombycilla cedrorum, 609
Bonasa umbellus umbellus, 433
Botaurus lentiginosus, 384
 Boysen Bay, 296
 Brant, Black, 742
Branta canadensis canadensis, 393
Branta nigricans, 742
 Brewerton district, 325
 Bridgeport district, 305
 Bridgeport, village, 303
Bubo virginianus virginianus, 501
 Buffle-head, 408
 Bullhead Bay district, 320
 Bunting, Indigo, 701
Buteo borealis borealis, 417
Buteo lagopus s. johannis, 744
Buteo lineatus lineatus, 418
Buteo platypterus platypterus, 421
Butorides virescens virescens, 377

C

Calidris canutus rufus, 746
 Canaseraga Creek, 301
 Canvas-back, 743
Capella delicata, 462

Cardinal, Eastern, 751
Carpodacus purpureus purpureus, 703
Casmerodias albus egretta, 375
 Catbird, 591, 738
Cathartes aura septentrionalis, 744
 Central Square, 706
Centurus carolinus, 749
Ceophloeus pileatus abieticola, 520
Certhia familiaris americana, 580
Chaetura pelagica, 507
Charadrius semipalmatus, 455
Charitonetta albeola, 408
 Chat, Yellow-breasted, 751
Chaulelasmus streperus, 742
 Chickadee, Black-capped, 575
 Chittenango Creek, 303
Chlidonias nigra surinamensis, 494
Chordeiles minor minor, 505
 Cicero, village of, 301
 Cicero Swamp district, 301
Circus hudsonius, 425
Cistothorus stellaris, 588
Clangula hyemalis, 743
 Clay, woods near, 298
 Cleveland district, 312
 Coble Point, 325
Coccyzus americanus americanus, 748
Coccyzus erythrophthalmus, 498
Colaptes auratus luteus, 517
Colinus virginianus virginianus, 744
Colymbus auritus, 362
Colymbus griseogen holboelli, 741
Compsothlypis americana pulissa, 631
 Constantia, 320
 Constantia Bay district, 320
 Coot, American, 453
 Cormorant,
 Double-crested, 742
 European, 741
Corthylio calendula calendula, 606
Corvus brachyrhynchos brachyrhynchos, 571
 Cowaselon Creek, 301
 Cowbird, Eastern, 695, 740
 Creeper, Brown, 580, 738
Crocethia alba, 482
 Crossbill, Red, 708
 Crow, Eastern, 571, 738
Cryptoglaux acadica acadica, 502
 Cuckoo,
 Black-billed, 498
 Yellow-billed, 748
 Curlew,
 Hudsonian, 746
 Long-billed, 746
Cyanocitta cristata cristata, 567
Cygnus columbianus, 742

D

Dafila acuta tzitziboa, 742
 Delahunt Woods, 316
 Delmarter Bay district, 304
Dendroica aestiva aestiva, 631
Dendroica caerulescens caerulescens, 639
Dendroica castanea, 651
Dendroica cerulea, 646

Dendroica coronata, 642
Dendroica fusca, 646
Dendroica magnolia, 636
Dendroica palmarum hypochrysea, 654
Dendroica palmarum palmarum, 653
Dendroica pensylvanica, 648
Dendroica pinus pinus, 750
Dendroica striata, 652
Dendroica tigrina, 638
Dendroica virens virens, 643
Dixon Island, 330
Dolichonyx oryzivorus, 679
Dove, Eastern Mourning, 496
Dowitcher, Eastern, 747
Dryobates pubescens medianus, 532
Dryobates villosus villosus, 528
Duck,
 Common Black, 394
 Greater Scaup, 403
 Lesser Scaup, 403
 Ring-necked, 743
 Ruddy, 409
 Wood, 402
Dumetella carolinensis, 591
Dunham Island, 326
Dutcher Woods, 717

E

Eagle,
 Golden, 744
 Southern Bald, 421
Ectopistes migratorius, 748
Egret, American, 375
Eider, King, 743
Elpis, 701
Emmons' Woods, 325
Empidonax flaviventris, 539
Empidonax minimus, 541
Empidonax traillii traillii, 540
Empidonax virescens, 749
Ereunetes pusillus, 480
Erismatura jamaicensis rubida, 409
Euphagus carolinus, 751

F

Falco columbarius columbarius, 744
Falco peregrinus anatum, 744
Falco sparverius sparverius, 431
Finch, Eastern Purple, 703
Fish Creek, 311
Fish Creek Landing, 311
Flicker, Northern, 517, 737
Flycatcher,
 Acadian, 749
 Alder, 540
 Least, 541
 Northern Crested, 535, 738
 Olive-sided, 544
 Yellow-bellied, 539
Francis Pond, 319
Frenchman Island, 329
Froher Bay, 303
Fulica americana americana, 453

G

Gadwall, 742
Gallinula chloropus cachinnans, 448

Gallinule, Florida, 448
Gavia immer immer, 361
Gavia stellata, 741
Geothlypis trichas brachidactyla, 663
Glaucionetta clangula americana, 407
Gnatcatcher, Blue-gray, 750
Godwit,
 Hudsonian, 747
 Marbled, 747
Golden-eye, American, 407
Goldfinch, Eastern, 705
Goose, Common Canada, 393
Gordon Pond, 319
Goshawk, Eastern, 744
Grackle, Bronzed, 692, 740
Grebe,
 Holboell's, 741
 Horned, 362
 Pied-billed, 363
Grosbeak,
 Eastern Evening, 702
 Rose-breasted, 699
Grouse, Eastern Ruffed, 433
Gull,
 Bonaparte's, 489
 Herring, 483
 Ring-billed, 487

H

Halixetus leucocephalus leucocephalus, 421
Hall Island, 301
Hawk,
 American Rough-legged, 744
 Broad-winged, 421
 Cooper's, 416
 Duck, 744
 Eastern Pigeon, 744
 Eastern Red-tailed, 417
 Eastern Sparrow, 431, 737
 Marsh, 425
 Northern Red-shouldered, 418
 Sharp-shinned, 416
Hedmyeles ludovicianus, 699
Heron,
 Black-crowned Night, 380
 Eastern Green, 377, 737
 Great Blue, 368
Hesperiphona vespertina vespertina, 702
Hirundo erythrogaster, 558
Hitchcock Point district, 303
Hummingbird, Ruby-throated, 509
Hylocichla fuscescens fuscescens, 601
Hylocichla guttata faxoni, 598
Hylocichla minima aliciae, 600
Hylocichla mustelina, 597
Hylocichla ustulata swainsoni, 600

I

Icteria virens virens, 751
Icterus galbula, 689
Icterus spurius, 751
Iridoprocne bicolor, 546
Ixobrychus exilis exilis, 388

J

Jay, Northern Blue, 567
Jewell district, 315

Johnson Bay district, 320
Junco hyemalis hyemalis, 719
 Junco, Slate-colored, 719

K

Kibby Lake, 319
 Killdeer, 456
 Kingbird, Eastern, 533, 738
 Kingfisher, Eastern Belted, 513, 737
 Kinglet,
 Eastern Golden-crowned, 750
 Eastern Ruby-crowned, 606
 Kittiwake, Atlantic, 747
 Knot, American, 746

L

Lakeport district, 305
Lanius ludovicianus migrans, 612
 Lark, Prairie Horned, 544
Larus argentatus smithsonianus, 483
Larus delawarensis, 487
Larus philadelphia, 489
 Leete Island, 330
 Lewis Point district, 306
Limnodromus griseus griseus, 747
Limosa fedoa, 747
Limosa haemastica, 747
 Little Bay Creek, 322
Lobipes lobatus, 747
 Long Island, 331
 Long Point, 296
 Loon,
 Common, 361
 Red-throated, 741
Lophodytes cucullatus, 410
 Lower South Bay district, 295
Loxia curvirostra pusilla, 708

M

Mallard, Common, 742
 Maple Bay, 297
 Maple Flats, 598
Mareca americana, 400
 Martin, Purple, 564
 McClanathan Woods, 297
 Meadowlark, Eastern, 682, 739
Megascyle alcyon alcyon, 513
Melanerpes erythrocephalus, 523
Melanitta deglandi, 743
Melanitta perspicillata, 743
Melospiza georgiana, 729
Melospiza lincolni lincolni, 752
Melospiza melodia melodia, 732
 Merganser,
 American, 410
 Hooded, 410
 Red-breasted, 411
Mergus merganser americanus, 410
Mergus serrator, 411
Micropalama himantopus, 747
 Milton Point, 322
Minus polyglottos polyglottos, 590
Mniotilta varia, 626
 Mockingbird, Eastern, 590
Molothrus ater ater, 695

Mud Creek, 301
 Mud Pond, 316
 Muskrat Bay, 296
Myiarchus crinitus boreus, 535
Myiochanes virens, 542

N

Nannus hiemalis hiemalis, 584
Nettion carolinense, 742
 New York State Barge Canal, 284
 Nicholson Point, 370, 400
 Nighthawk, Eastern, 505
 Norcross Point, 296
 North Bay district, 311
 North Bay, village, 312
 North Manlius district, 666, 714
Numenius americanus americanus, 746
 Nuthatch,
 Red-breasted, 580
 White-breasted, 578
Nuttallornis mesoleucus, 544
Nycticorax nycticorax hoactli, 380
Nyroca affinis, 403
Nyroca americana, 743
Nyroca collaris, 743
Nyroca marila, 403
Nyroca valisineria, 743

O

Oakland Beach, 310
 Oak Orchard district, 325
Oidemia americana, 743
 Old-squaw, 743
 Oneida Creek, 284
 Oneida River, 325
Oporornis agilis, 751
Oporornis philadelphia, 662
 Oriole,
 Baltimore, 689
 Orchard, 751
 Osprey, 430
Octocoris alpestris praticola, 544
Otus asio naevius, 500
 Oven-bird, 654
 Owl,
 Barn, 749
 Eastern Screech, 500
 Great Horned, 501
 Long-eared, 749
 Northern Barred, 749
 Saw-whet, 502
 Short-eared, 749
Oxyechus vociferus vociferus, 456

P

Pagolla wilsonia wilsonia, 745
Pandion haliaetus carolinensis, 430
 Panther Lake, 318
 Parker Woods, 502
Passer domesticus domesticus, 677
Passerculus sandwichensis savanna, 711
Passerella iliaca iliaca, 728
Passerherbulus henslowi susurrans, 715
Passerina cyanea, 701
Pelidna alpina sakhalina, 746

Penthestes atricapillus atricapillus, 575
 Petrel, Black-capped, 741
Petrochelidon albifrons albifrons, 561
 Pewee, Eastern Wood, 542
Phaeopus hudsonicus, 746
Phalacrocorax auritus auritus, 742
Phalacrocorax carbo carbo, 741
 Phalarope,
 Northern, 747
 Red, 747
 Wilson's, 747
Phalaropus fulicarius, 747
Phasianus colchicus torquatus, 436
 Pheasant, Ring-necked, 436
 Phillips Point district, 320
Philohela minor, 460
 Phoebe, Eastern, 537, 738
 Pigeon, Passenger, 748
 Pintail, American, 742
Pipilo erythrophthalmus erythrophthalmus, 709
 Pipit, American, 607
Piranga erythromelas, 698
Pisobia bairdi, 746
Pisobia fuscicollis, 746
Pisobia melanotos, 477
Pisobia minutilla, 478
 Plover,
 American Golden, 745
 Black-bellied, 745
 Semipalmated, 455
 Upland, 464
 Wilson's, 745
Pluvialis dominica dominica, 745
 Poddygut Bay, 320
Podilymbus podiceps podiceps, 363
Polioptila caerulea caerulea, 750
Poocetes gramineus gramineus, 716
Porzana carolina, 446
 Potter Bay, 470
Progne subis subis, 564
Protonotaria citrea, 628
Pterodroma hasitata, 741

Q

Querquedula discors, 400
Quiscalus quiscula aeneus, 692

R

Rail, Virginia, 442
Rallus limicola limicola, 442
 Redhead, 743
 Redstart, American, 672
 Red-wing, Eastern, 684, 739
Regulus satrapa satrapa, 750
Richmondia cardinalis cardinalis, 751
Riparia riparia riparia, 550
Rissa tridactyla tridactyla, 747
 Robin, Eastern, 594, 739

S

Sanderling, 482
 Sandpiper,
 Baird's, 746
 Eastern Solitary, 472
 Least, 478
 Pectoral, 477

Red-backed, 746
 Semipalmated, 480
 Spotted, 465, 737
 Stilt, 747
 White-rumped, 746
 Sapsucker, Yellow-bellied, 526
 Sauers' Woods, 535
Sayornis phoebe, 537
 Schroepfels Bridge, 326
 Scoter,
 American, 743
 Surf, 743
 White-winged, 743
Seiurus aurocapillus, 654
Seiurus motacilla, 660
Seiurus noveboracensis noveboracensis, 658
Setophaga ruticilla, 672
 Shackelton Point district, 304
 Shaw Bay district, 320
 Shaw Point district, 320
 Short Point, 295
 Short Point Bay, 320
 Shoveller, 743
 Shrike, Migrant, 612
Sialia sialis sialis, 604
 Siskin, Northern Pine, 705
Sitta canadensis, 580
Sitta carolinensis carolinensis, 578
 Snipe, Wilson's, 462
Somateria spectabilis, 743
 Sora, 446
 South Bay district, 306
 Sparrow,
 Acadian, 751
 Eastern Chipping, 721, 740
 Eastern Field, 723
 Eastern Fox, 728
 Eastern Grasshopper, 714
 Eastern Henslow's, 715
 Eastern Savannah, 711, 740
 Eastern Song, 732, 740
 Eastern Tree, 720
 Eastern Vesper, 716
 English, 677
 Lincoln's, 752
 Nelson's, 752
 Swamp, 729
 White-crowned, 725
 White-throated, 726
Spatula clypeata, 743
Sphyrapicus varius varius, 526
Spinus pinus pinus, 705
Spinus tristis tristis, 705
Spizella arborea arborea, 720
Spizella passerina passerina, 721
Spizella pusilla pusilla, 723
Squatarola squatarola, 745
 Starling, 613, 739
 State Bridge, 544, 677
 Steding Woods, 661
Steganopus tricolor, 747
Stelgidopteryx ruficollis serripennis, 556
Sterna hirundo hirundo, 490
Strix varia varia, 749
Sturnella magna magna, 682
Sturnus vulgaris vulgaris, 613
 Swan, Whistling, 742
 Swallow,

Bank, 550, 738
 Barn, 558, 738
 Northern Cliff, 561
 Rough-winged, 556
 Tree, 546, 738
 Swift, Chimney, 507
 Sylvan Beach, 309
 Sylvan Beach district, 306
 Syracuse Yacht and Country Club, 296

T

Tanager, Scarlet, 698
 Teal,
 Blue-winged, 400
 Green-winged, 742
Telmatodytes palustris palustris, 585
 Tern,
 Black, 494
 Common, 490, 737
 Thrasher, Brown, 593
 Thrush,
 Eastern Hermit, 598, 739
 Gray-cheeked, 600
 Olive-backed, 600
 Wood, 597
Totanus flavipes, 474
Totanus melanoleucus, 473
 Towhee, Red-eyed, 709
Toxostoma rufum, 593
Tringa solitaria solitaria, 472
Troglodytes aëdon aëdon, 582
Turdus migratorius migratorius, 594
 Turnstone, Ruddy, 459
Tyrannus tyrannus, 533
Tyto alba pratincola, 749

V

Van Antwerp Woods, 297
 Vandercamp Pond, 317
 Vandercamp Woods, 317
 Veery, 601, 739
Vermivora celata celata, 750
Vermivora chrysoptera, 628
Vermivora peregrina, 629
Vermivora ruficapilla ruficapilla, 630
 Verona Beach, 306
 Vireo,
 Blue-headed, 620
 Philadelphia, 750
 Plumbeous, 750
 Red-eyed, 622
 Warbling, 624
 White-eyed, 750
 Yellow-throated, 619, 739
Vireo flavifrons, 619
Vireo gilvus gilvus, 624
Vireo griseus griseus, 750
Vireo olivaceus, 622
Vireo philadelphicus, 750
Vireo solitarius plumbeus, 750
Vireo solitarius solitarius, 620
 Vulture, Turkey, 744

W

Wantry Island, 329
 Warbler,
 Bay-breasted, 651
 Black and white, 626
 Blackburnian, 646
 Black-poll, 652
 Black-throated Blue, 639
 Black-throated Green, 643, 739
 Canada, 669
 Cape May, 638
 Cerulean, 646
 Chestnut-sided, 648
 Connecticut, 751
 Eastern Yellow, 631
 Golden-winged, 628
 Hooded, 667
 Magnolia, 636
 Mourning, 662
 Myrtle, 642
 Nashville, 630
 Northern Parula, 631
 Northern Pine, 750
 Orange-crowned, 750
 Prothonotary, 628
 Tennessee, 629
 Western Palm, 653
 Wilson's, 668
 Yellow Palm, 654
 Water-Thrush,
 Louisiana, 660
 Northern, 658
 Waxwing, Cedar, 609, 739
 West Monroe district, 321
 West Vienna district, 315
 Whip-poor-will, Eastern, 503
 Widrig Woods, 597, 599
 Willard Island, 330
Wilsonia canadensis, 669
Wilsonia citrina, 667
Wilsonia pusilla pusilla, 668
 Woodcock, American, 460
 Woodpecker,
 Eastern Hairy, 528
 Northern Downy, 532, 738
 Northern Pileated, 520
 Red-bellied, 749
 Red-headed, 523
 Wren,
 Eastern House, 582
 Eastern Winter, 584
 Long-billed Marsh, 585
 Short-billed Marsh, 588
 Wright Woods, 301

Y

Yellow-legs
 Greater, 473
 Lesser, 474
 Yellow-throat, Northern, 663

Z

Zenaidura macroura carelinensis, 496
Zonotrichia albicollis, 726
Zonotrichia leucophrys leucophrys, 725



Map 2. Map of Oneida Lake and contiguous territory showing routes traversed and places visited during this investigation. Adapted from the U. S. Geological Survey Quadrangles. Key shows counties immediately surrounding Oneida Lake and the location of this lake in relation to other central New York lakes.

THE ROOSEVELT WILD LIFE MEMORIAL

As a State Memorial

The State of New York is the trustee of this wild life Memorial to Theodore Roosevelt. The New York State College of Forestry at Syracuse is a State institution supported solely by State funds, and the Roosevelt Wild Life Forest Experiment Station is a part of this institution. The Trustees are State officials. A legislative mandate instructed them as follows:

"To establish and conduct an experimental station to be known as 'Roosevelt Wild Life Forest Experiment Station,' in which there shall be maintained records of the results of the experiments and investigations made and research work accomplished; also a library of works, publications, papers and data having to do with wild life, together with means for practical illustration and demonstration, which library shall, at all reasonable hours, be open to the public." [Laws of New York, chapter 536. Became a law May 10, 1919.]

As a General Memorial

While this Memorial Station was founded by New York State, its functions are not limited solely to the State. The Trustees are further authorized to cooperate with other agencies, so that the work is by no means limited to the boundaries of the State or by State funds. Provision for this has been made by the law as follows:

"To enter into any contract necessary or appropriate for carrying out any of the purposes or objects of the College, including such as shall involve cooperation with any person, corporation or association or any department of the government of the State of New York or of the United States in laboratory, experimental, investigative or research work, and the acceptance from such persons, corporation, association, or department of the State or Federal government of gifts or contributions of money, expert service, labor, materials apparatus, appliances or other property in connection therewith." [Laws of New York, chapter 42. Became a law March 7, 1918.]

By these laws the Empire State has made provision to conduct forest wild life research upon a comprehensive basis, and on a plan as broad as that approved by Theodore Roosevelt himself.



BURLAND PRINTING CO., INC.
NEW YORK

